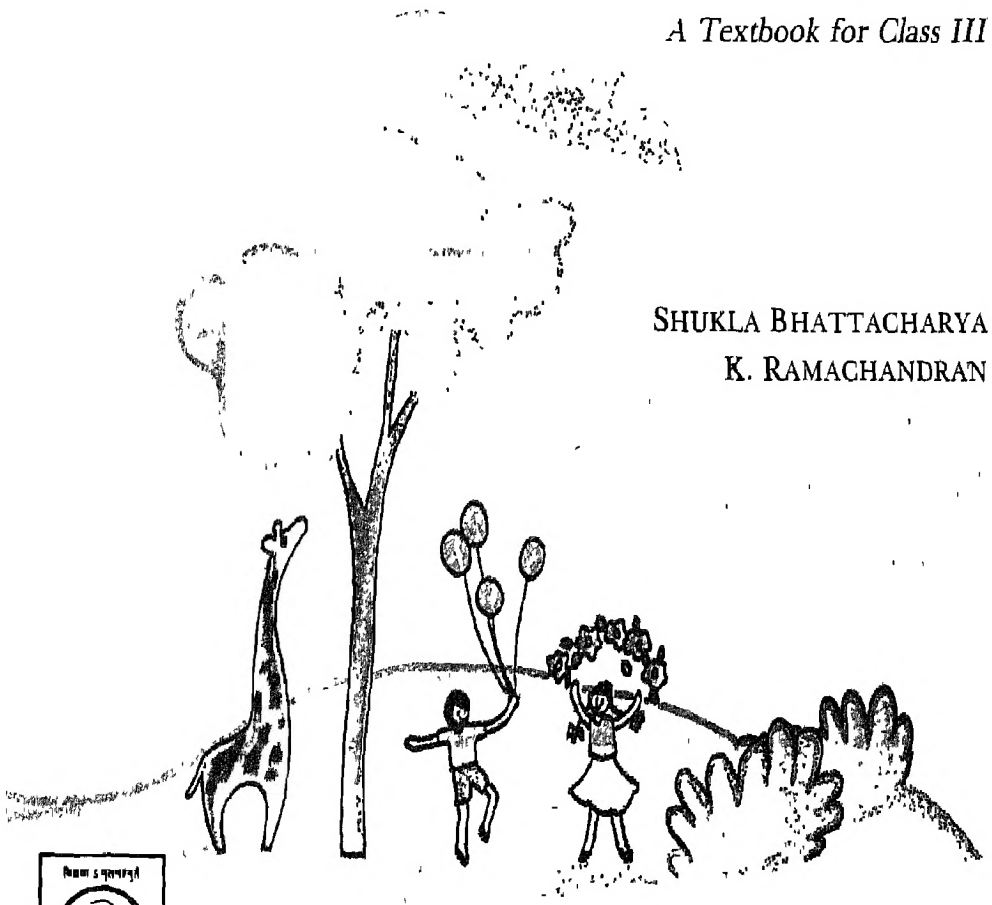
Environmental Studies—SCIENCE

EXPLORING ENVIRONMENT

BOOK ONE

A Textbook for Class III



SHUKLA BHATTACHARYA
K. RAMACHANDRAN

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

July 1987
Asadha 1909

P.D. 150T—DPG

Publication Team

Prabhakar Dwivedi *Chief Editor* C N Rao *Chief Production Officer*
D P Gupta *Editor* Suresh Chand *Production Officer*
Karan Chadha *Artist*
V R Devikar *Production Assistant*

Design and Illustrations
BHARATI MIRCHANDANI

Published at the Publication Department by the Secretary, National Council of Educational Research and Training, Sri Aurobindo Marg, New Delhi 110 016, photocomposed at ARG Graphics Private Limited, B 3/64, Azad Apartments, Sri Aurobindo Marg, New Delhi 110 016 and printed at India Offset Press, A-1, Mayapuri Industrial Area, New Delhi 110 064

During the early years of development, a child learns mainly through observation and exploration of the environment around him/her To facilitate his/her learning and development a child at the primary stage needs to be provided with ample opportunities to sharpen his/her senses to enable him/her to systematically observe things and occurrences of events in the environment, to formulate questions related to different environmental phenomena and seek answers to them by performing experiments, collecting data and analysing and interpreting them Environmental Studies, therefore, occupies a central place in the curriculum at the primary stage

The present book forms a part of the package of instructional materials in Environmental Studies at the primary stage It is based on the syllabus for Environmental Studies (Science) for Class III developed in the context of implementation of the National Policy on Education 1986 The topics and the contents of the book have been woven round the child and his interaction with various components of the environment around him/her in order to unfold gradually the natural and physical aspects of the environment and to acquaint the child with the basic principles and processes associated with different environmental phenomena Emphasis has been placed on learning by observation and doing. Different kinds of activities that would enable children to discover ideas for themselves and to develop their own generalisations about different environmental processes and phenomena have been indicated in each chapter of the book These activities are simple experiments that can easily be performed by the students

Each chapter in the book is followed by a section entitled 'Test Yourself' containing certain questions which are to be answered by the students This is followed by a section entitled 'Things to Do' which indicates activities that can be performed by the students either in the classroom or at home to enrich their learning experiences

The book envisages selection and organisation of teaching-learning activities that would provide opportunities to the learners to explore their environment and to participate in different kinds of activities so as to enable them to think, to question, to experiment and to seek explanations about the different environmental phenomena. In this context, the role of the teacher emerges to be very significant Since the environment and the

experiences of the children outside the school vary from place to place, emphasis should be laid on activities drawn from the experience of the children The activities suggested in the textbook are, therefore, neither prescriptive nor exhaustive. They may be modified keeping in view their relevance to the life situations of the learners The teacher may design different activities depending upon the environmental situations around the school However, the activities should be in conformity with the learning outcomes expected to be attained by the learners

The draft of the book was prepared by Smt Shukla Bhattacharya and Shri K Ramachandran of the Department of Pre-School and Elementary Education (DPSEE), NCERT The draft manuscript was reviewed in a workshop held at New Delhi from 24 to 28 November 1986 The workshop was attended by practising teachers ad subject experts. The final draft of the manuscript was once again reviewed in a workshop which was held at New Delhi from 10 to 14 February 1987, and was attended by some teachers of Kendriya Vidyalayas and other schools in Delhi. In the light of the suggestions made by the participants of the two workshops, the manuscript was refined resulting in the book in its present form

I am grateful to Prof P N Dave, DPSEE, and his colleagues, Smt. Shukla Bhattacharya and Shri K. Ramachandran who worked hard for bringing out this book. I wish to express my grateful appreciation to the participants of the two workshops who went through the manuscript and offered valuable suggestions for its improvement. I am also thankful to Km Manju Sharma, JPF, DPSEE, who helped in preparing the final copy of the manuscript.

I hope that the children for whom this book has been written will find it useful and interesting Suggestions and comments for the improvement of the book would be most welcome The Council will give due consideration to all such suggestions and comments while revising the present edition of the book

P L MALHOTRA
Director
National Council of
Educational Research and Training

ACKNOWLEDGEMENTS

The National Council of Educational Research and Training is grateful to the following who reviewed the manuscript of the book and offered valuable suggestions for its improvement in a workshop held at New Delhi from 24 to 28 November 1986

1 Smt Jayshree Mehta
Scientist
Vikram A Sarabhai
Community Science Centre
Ahmedabad

2 Dr B L Pandit
Lecturer, DESM, NCERT
New Delhi

3 Dr (Smt) Puloma Shah
Geneticist
D-323, Defence Colony
New Delhi

4 Dr. M N Siddiqi
Education Officer
Municipal Corporation of Delhi
Delhi

5 Smt Neelam Sood
Teacher
Kendriya Vidyalaya No 2
Hindon, Ghaziabad District (U P)

6. Shri Sehdev Sisodia
Teacher
M C School
Dev Nagar
New Delhi

The Council is also grateful to the following who went through the final draft of the manuscript of this book and offered valuable suggestions for

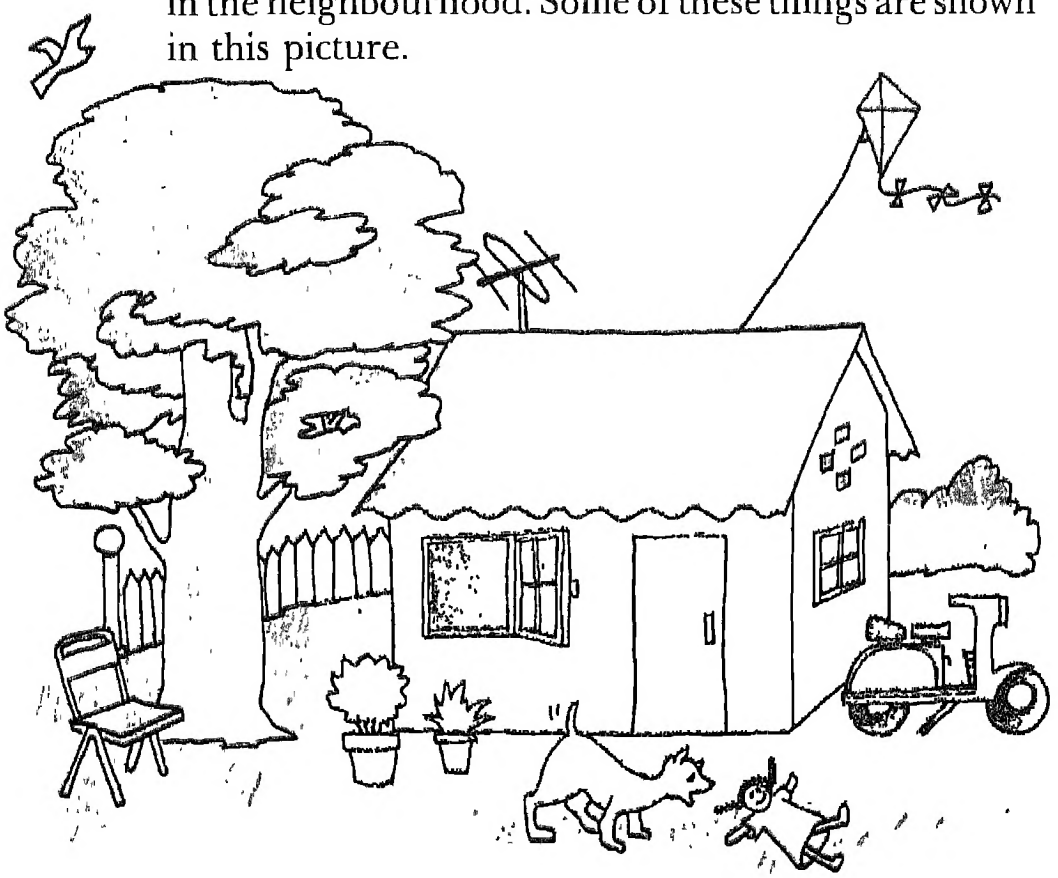
its improvement in a workshop held at New Delhi from 10 to 14 February 1987.

1. Smt Shashi Kiran Kapur
   Primary Teacher
   Kendriya Vidyalaya
   Andrews Ganj
   New Delhi
2. Smt Veena Sharma
   Primary Teacher
   Kendriya Vidyalaya
   I.N.A Colony
   New Delhi
3. Smt. Neelam Sood
   Primary Teacher
   Kendriya Vidyalaya No 2
   Hindon
   Ghaziabad District (U.P)

CHAPTER 1

Things Around Us

Observe different kinds of things around you. Make a list of things you find at home, in school and in the neighbourhood. Some of these things are shown in this picture.

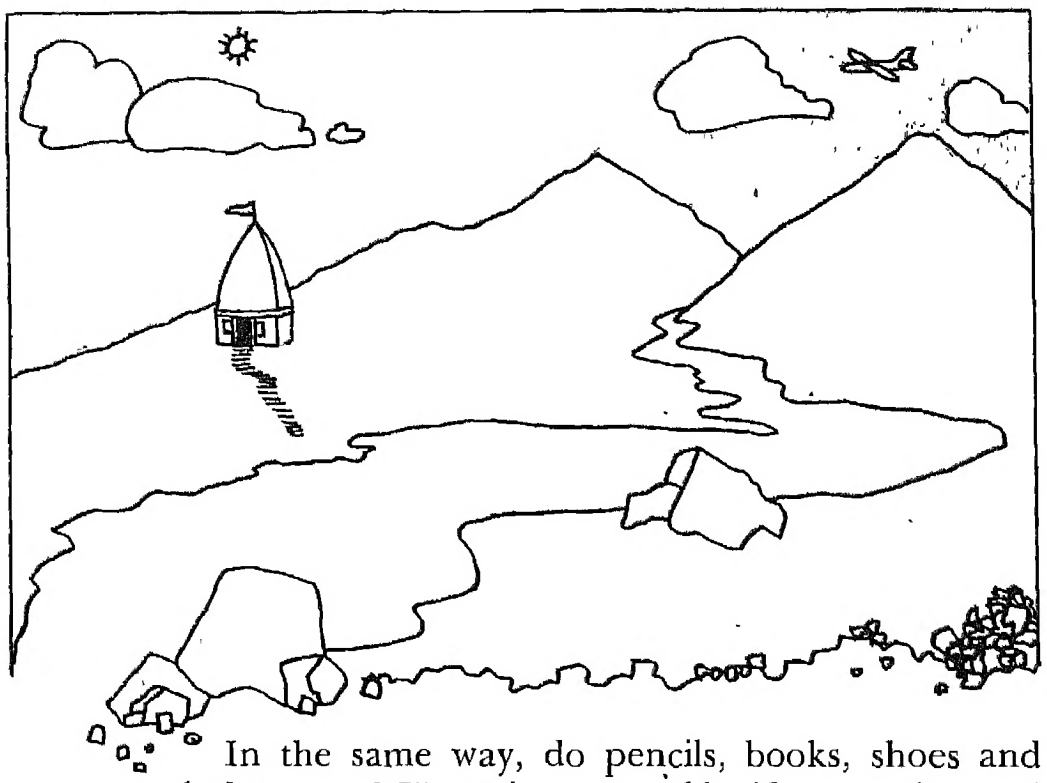


Study the picture carefully. Identify the things which are made by man. Identify the things which are not made by man. Group these things as shown below :

Things which are made by man	*Things which are not made by man*

Things which are made by man are called man-made things. Things which occur in nature are called natural things. Find out other man-made and natural things around you. Make a list.

Look at the things shown below. Do these things grow? Do they move on their own?



In the same way, do pencils, books, shoes and clothes grow? How nice it would be if our clothes and shoes could also grow as we grow bigger. But these cannot grow. If story books could walk and talk to us, it would be wonderful. But it is sad that story books cannot walk and talk. Clothes and shoes do not grow.

Now look at your list of things once again. Find out which of the things in your list do not grow and cannot move from place to place on their own. These are all non-living things. Is there something in your list which can grow and move from place to place?

You have seen that a kitten grows into a big cat. A little puppy grows into a dog. All animals such as cows, goats, monkeys, butterflies, parrots and many others, grow. They also move from place to place. If you have a baby sister or brother you must have seen her/him growing.

What about the beautiful green plants and trees around us? Do they also grow? Do they move from place to place? Plants and animals are living things. They grow.

On your way to school, you must have seen many big and small plants. After the rainy season you will find new plants growing. During some months new branches and leaves come out in some plants. How can you find out about the growth of plants?

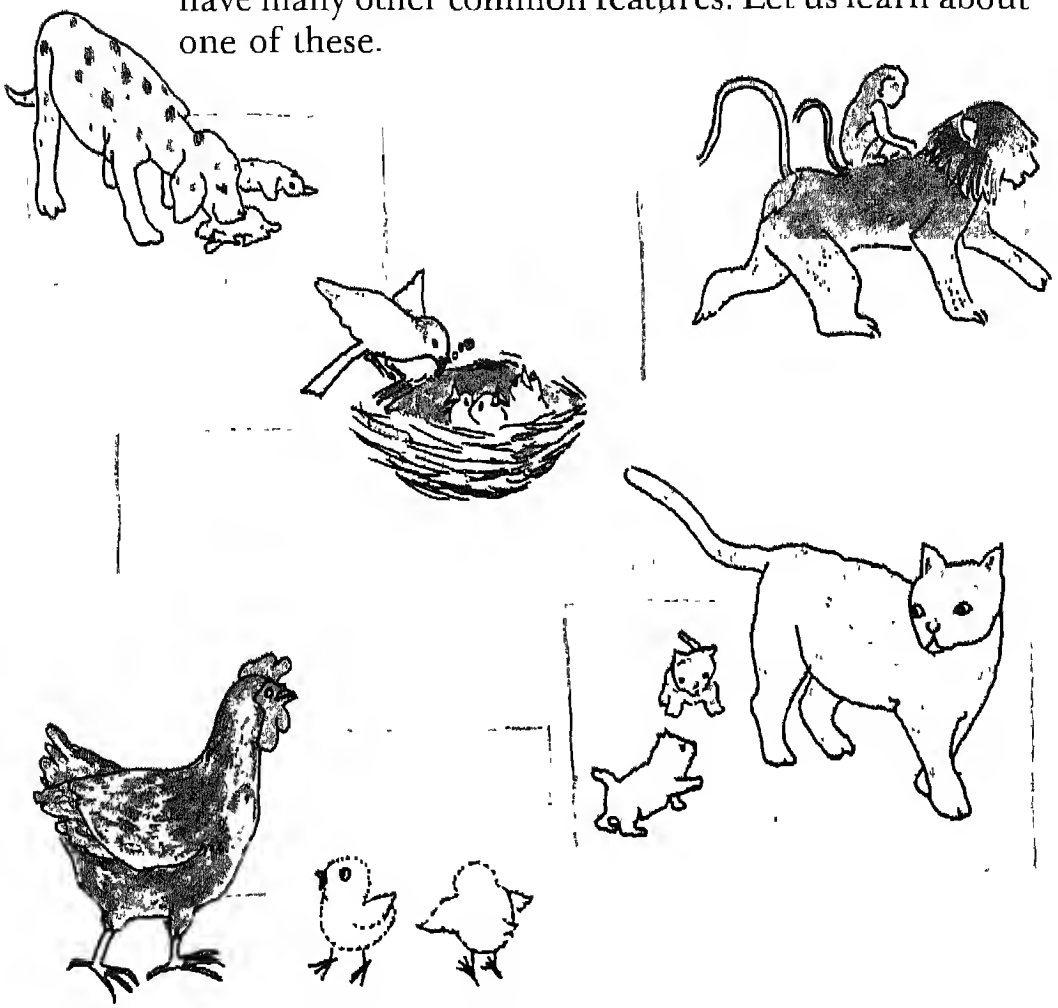
DO THIS ACTIVITY

Observe a newly grown potted plant for 10 days. Observe the changes that take place. Record your observations in the table given below :

Number of days	*Changes in the Plant*		
	Height of the Plant	*Number of leaves*	*Other changes*
1st day			
3rd day			
5th day			
7th day			
10th day			

What changes do you find in the plant from the first day to the tenth day?

Apart from growth and movement, living things have many other common features. Let us learn about one of these.



You would have seen sparrows and pigeons build their nests. They lay their eggs in the nests. Soon the eggs hatch and young chicks come out. Young chicks are baby birds. Like the birds, other animals also have babies. Dogs have puppies. Cats have kittens. Hens have chickens. We human beings have babies. All living things can produce their own kind.

Plants also give rise to new plants. New plants are generally grown from seeds. Find out in what other ways we can grow new plants?

TEST YOURSELF

1. Name two characteristics of living things.
2. Group the following into living things and non-living things.

   Piece of wood empty bee-hive, butterfly, sand hill/mud hill, cockroach, paddy plant, maize cob, stream.

Living things	*Non-living things*

3. You have seen clouds moving across the sky. You have also seen a bus moving on the road. Are they living things? Give two reasons to support your answer.
4. Given below are a few things seen in your surroundings. Group them into man-made things and natural things.

   Rose plant, fan, butterfly, boat, table, cup-board, mountain, chair, snake, horse.

Man-made things	*Natural things*

THINGS TO DO

1 Make a list of a few natural things you see in and around your house. Group them into living and non-living things.

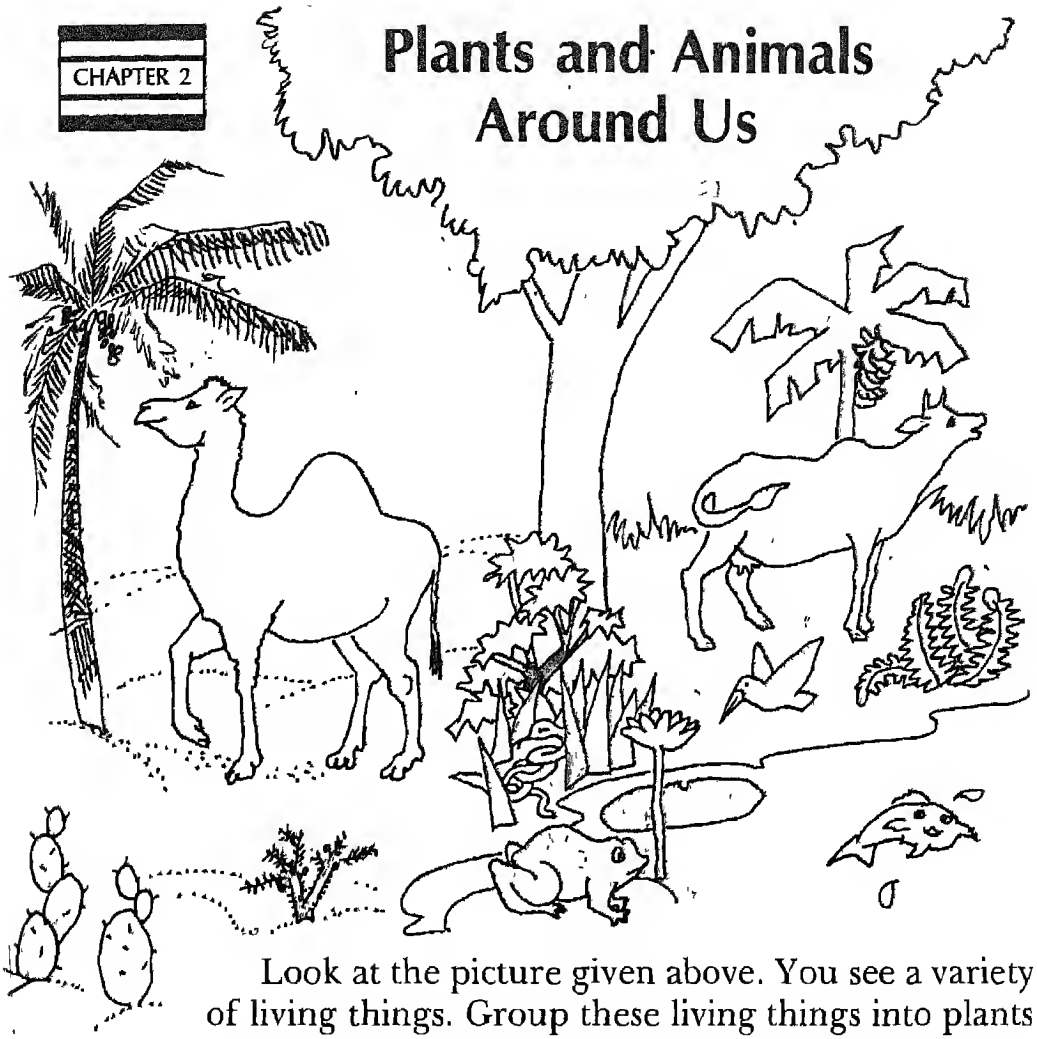
	Living things	*Non-living things*
(i)		
(ii)		
(iii)		
(iv)		
(v)		
(vi)		
(vii)		
(viii)		
(ix)		
(x)		

2 Sow some seeds of common plants that grow in your locality, in pots. Observe the seeds as they sprout into seedlings. Carefully note down the changes you observe for a week.

3 Make a list of the plants which are grown from seeds.

CHAPTER 2

Plants and Animals Around Us



Look at the picture given above. You see a variety of living things. Group these living things into plants and animals. Now look at the plant group. Do you find any similarity?

Go out in the open. Look at the trees. Look at the thick woody trunk, lovely green leaves, and swaying branches of trees. You may also find flowers on some trees.

Have you seen small plants being planted at home, in the garden, farm or by the roadside? Visit such a place. Look at the plant before it is planted. Observe the part of the plant that remains under the soil. Is it branched? What is its colour? Observe the part of

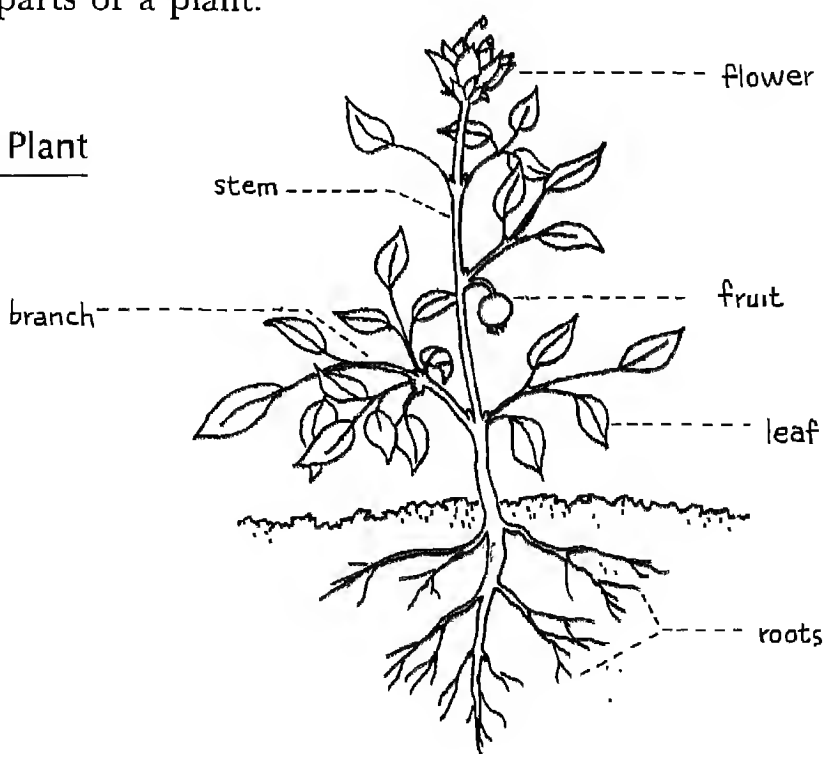
the plant that is above the soil. What is its colour? Does it also have branches? The part of the plant which is under the soil is called the root. What are the other parts of the plant?

DO THIS ACTIVITY

Take a glass jar. Put a sheet of old newspaper inside the jar . Now place some soaked beans or any other seeds between the newspaper and the jar. Put some water in the jar. Observe the seeds after some days . You will see roots coming out from the seeds . Watch these for some more days. You will see the young seedlings. Look carefully at the roots, stems and leaves of the seedlings.

Look at the picture on this page. It shows different parts of a plant.

Parts of a Plant



Draw a sketch of the plant you have studied. Compare it with the picture of the plant given here. Most of the plants have *roots, stem, leaves, flowers* and *fruits*. Apart from these parts, plants also have seeds. Most of the fruits contain seeds. We use seeds to grow new plants.

Let us find out if all the plants look alike.

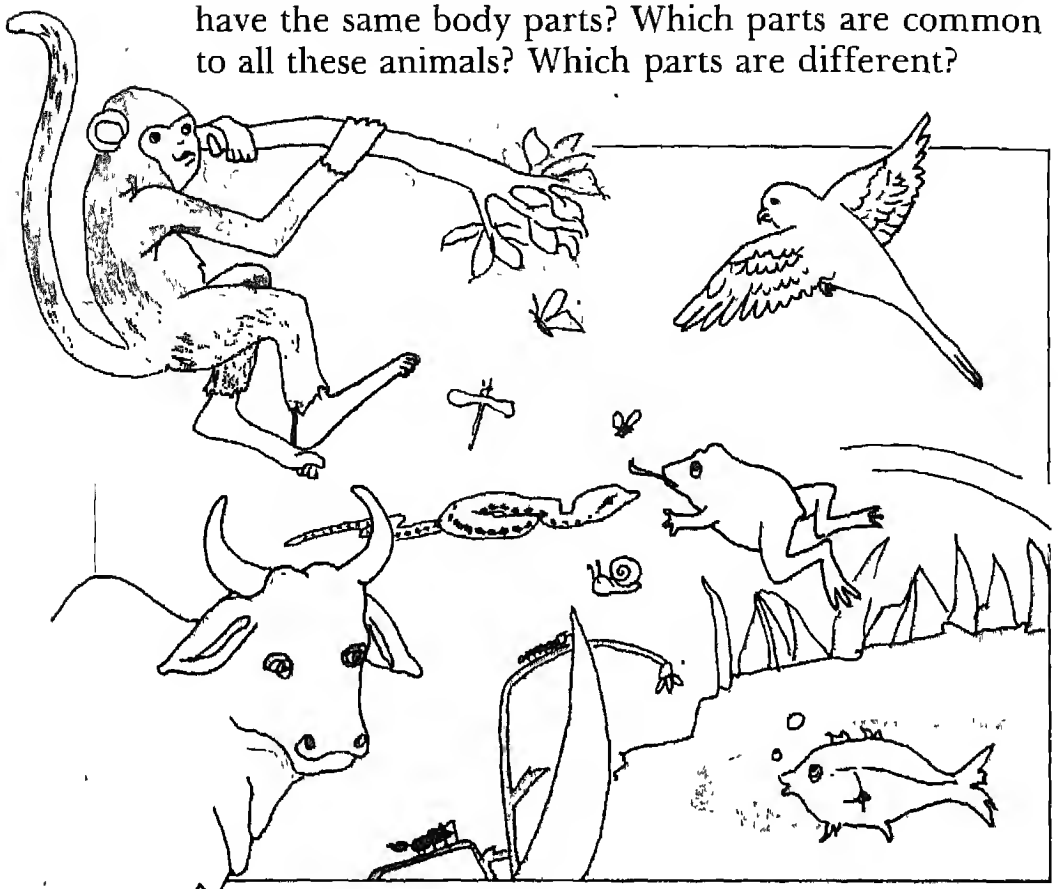
DO THIS ACTIVITY

Select five plants from your locality. Carefully look at each plant. Feel the stem. Is it hard or soft? Does it stand erect? What is its colour? Observe other parts. Note down your observations in the table given below.

	Local Name of the plant	*Type of stem : hard/ soft and erect/ not erect*	*Flowers : colour and shape*	*Leaves : colour and shape*	*Fruits : present/ Absent*	*Seeds : Present/ Absent*
1						
2						
3						
4						
5						

From the above table you will see that most of the plants have the same parts. But they differ in details, such as shape, size and colour. Each kind of plant looks different from the other. Some plants may not have all the parts. Name some plants which do not have all these parts.

Like plants, animals also have different body parts. Look at the picture given below. Do these animals have the same body parts? Which parts are common to all these animals? Which parts are different?



Do all these animals have the same number of legs? Name some animals from your locality which have two legs, four legs, six legs, more than six legs and no legs at all.

DO THIS ACTIVITY

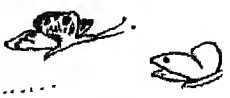
Observe the animals in your locality. Which of these animals are four-footed? Compare these with five common types of birds. In what way are the four-footed animals different from the birds? In what way are they similar?

Most of the four-footed animals have a head, neck, chest, belly and legs. Compare your own body parts with the body parts of the animals in your locality.

Each type of animal looks different from every other type. A cat looks different from a dog. A cow looks different from a buffalo. Each kind of animal has special body features which make it look different from other kinds of animals.

But do all animals of the same kind look alike? Do all cats look alike? Do all butterflies look alike?

All living things have some common features. But each kind of animal or plant has certain specific features.



Plants and animals are our natural resources. We must protect them. What would the world or our life be like if there were no birds singing, no flowers blooming, no honeybees buzzing and no frogs croaking in the rainy season. It would be empty and still all around us. We must make plants and animals our friends. Plants and animals are members of one big family and we are a part of that family. Next time when you kill an animal or break the branches of a tree just for fun, remember they need your help.

TEST YOURSELF

1 Write down one important difference between a root and a stem.

2 Which part of the plant contains seeds?

3 Fill in the blanks with suitable words :

(i) Most plants have a root, stem and _____

(ii) The erect portion of a plant above the soil is called

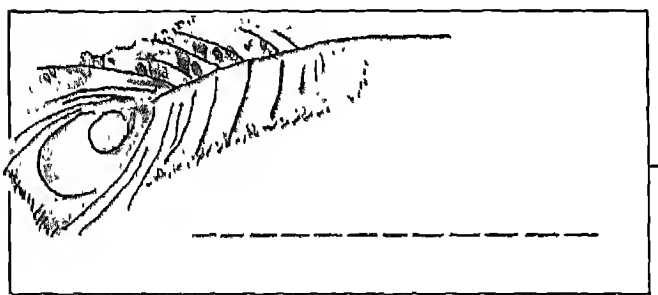
_____

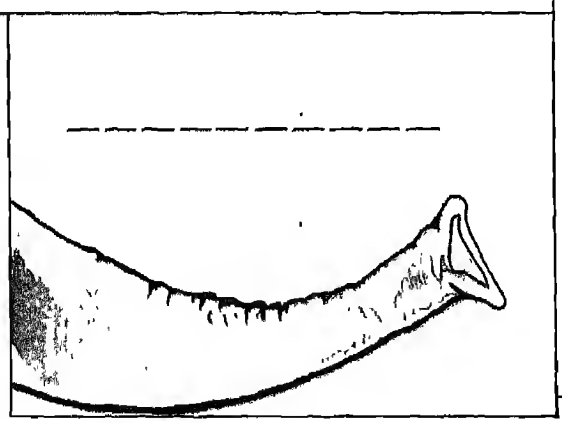
4 Given below are names of some parts of a plant and an animal. Group them into parts of a plant and parts of an animal.

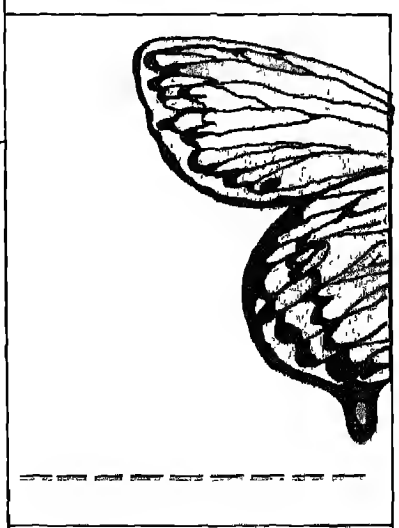
Neck,flower,root,head,stem,leg,chest,fruit

Parts of a plant	*Parts of an animal*

5 Given below are pictures of body parts of some animals. Identify and name the animal against each picture.







6 Draw a picture of any local plant. Write down the names of different parts of the plant.

7 Write the names of five plants, five birds and five four-footed animals found in your locality.

THINGS TO DO

1 Collect 10 leaves and 10 flowers of different types and press them between the folds of a newspaper. After they are dried and pressed, paste these in your scrap book. If possible, find out the names of the plants.

2 Observe five flowering plants/trees in your locality. Collect information about these trees. Write it down in the table given below :

	Name of the plant/tree (Local name)	*Where is it grown : roadside/ garden/any other place*	*Leaves : colour, size and shape*	*Time of flower-ing*	*Flowers : colour and smell*

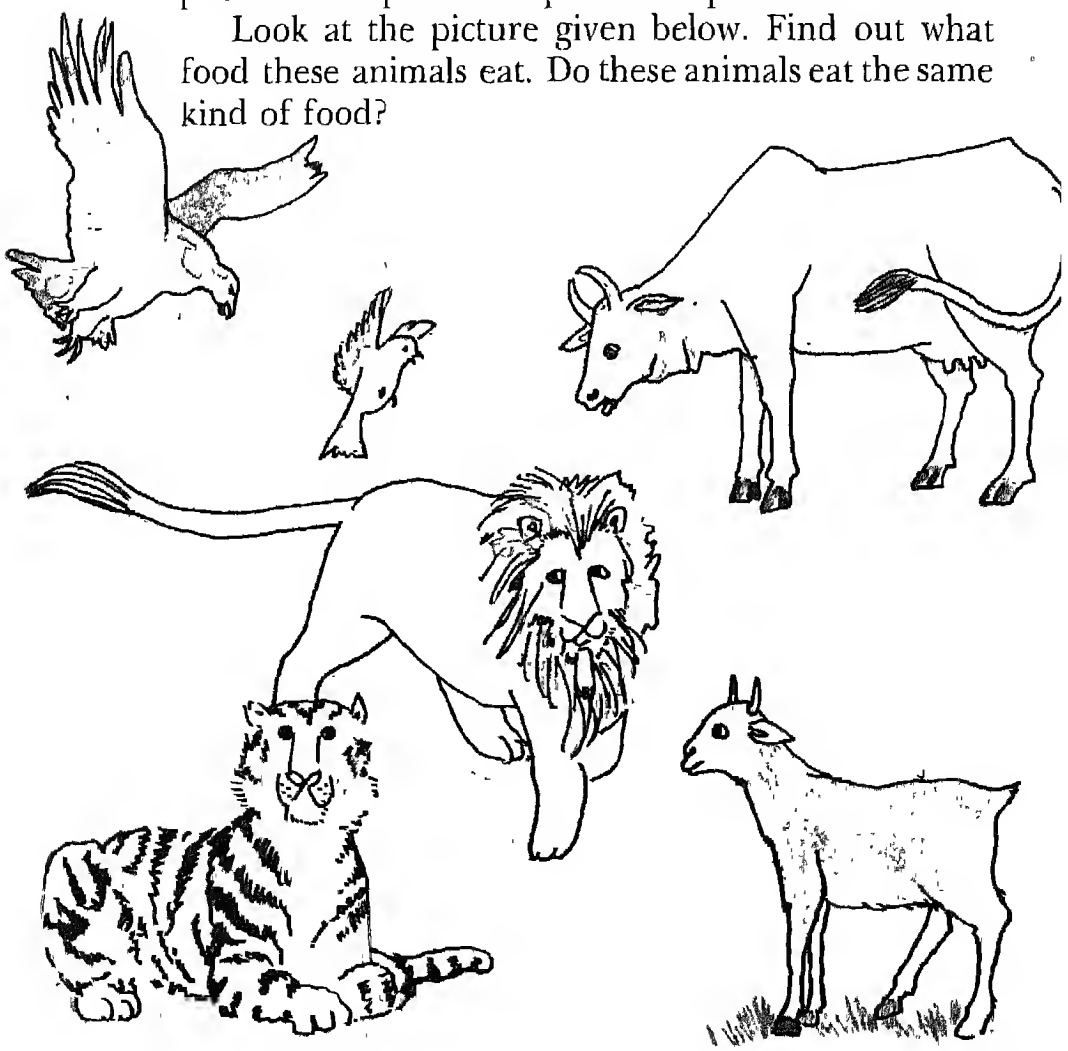
3. Look at common insects such as a Cockroach, House fly, Butterfly and Ant. (You may add some more names). Note down the similarities in their body structures. Also note down the differences.

CHAPTER 3

Animals and Their Way of Life

In the last chapter, you have learnt about the body parts of animals and the parts of plants. You know that different plants and animals are found in different places. They have many features which are peculiar to a particular plant or a particular animal.

Look at the picture given below. Find out what food these animals eat. Do these animals eat the same kind of food?

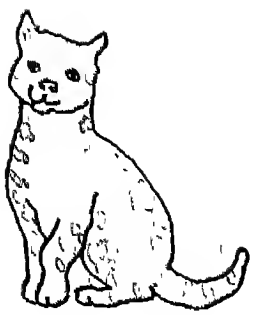


The food of some animals is similar. For example, cows, buffaloes and many other animals eat plants. They live on grass, plants and other food products obtained from plant sources. Name other animals that eat plants. Some animals like cats, dogs, tigers and many others eat mainly flesh. You can find out what kind of food an animal eats by looking at its body parts. How can you do this?

DO THIS ACTIVITY

Carefully look at the feet of a dog and a cat. Do they look similar? In what way are they different?

The picture given below will help you to find out.

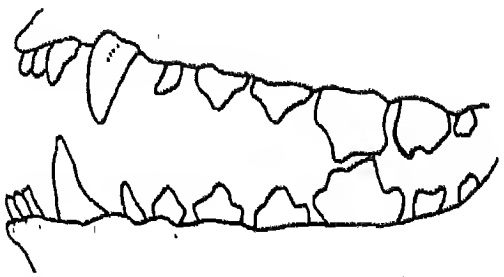


Paw of a cat

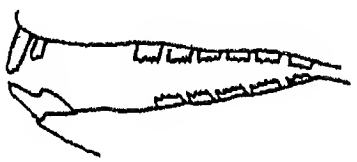
Foot of a dog

A cat walks softly and silently when it is trying to catch its prey. Look at the paw of a cat. How do the paws help a cat to catch mice ?

Observe the picture given below. It shows the inside of the mouth of some animals. Look at their teeth. In what way do the teeth of a dog look different from the teeth of a rabbit?



Teeth of a dog, a flesh-eating animal



Teeth of a rabbit, a plant-eating animal

All flesh-eating animals have teeth which help them to tear flesh.

Plant-eating animals such as cows, goats, and buffaloes have sharp front teeth. These help them to bite off leaves and branches of plants. These animals also have broad strong teeth which help them in chewing their food.

DO THIS ACTIVITY

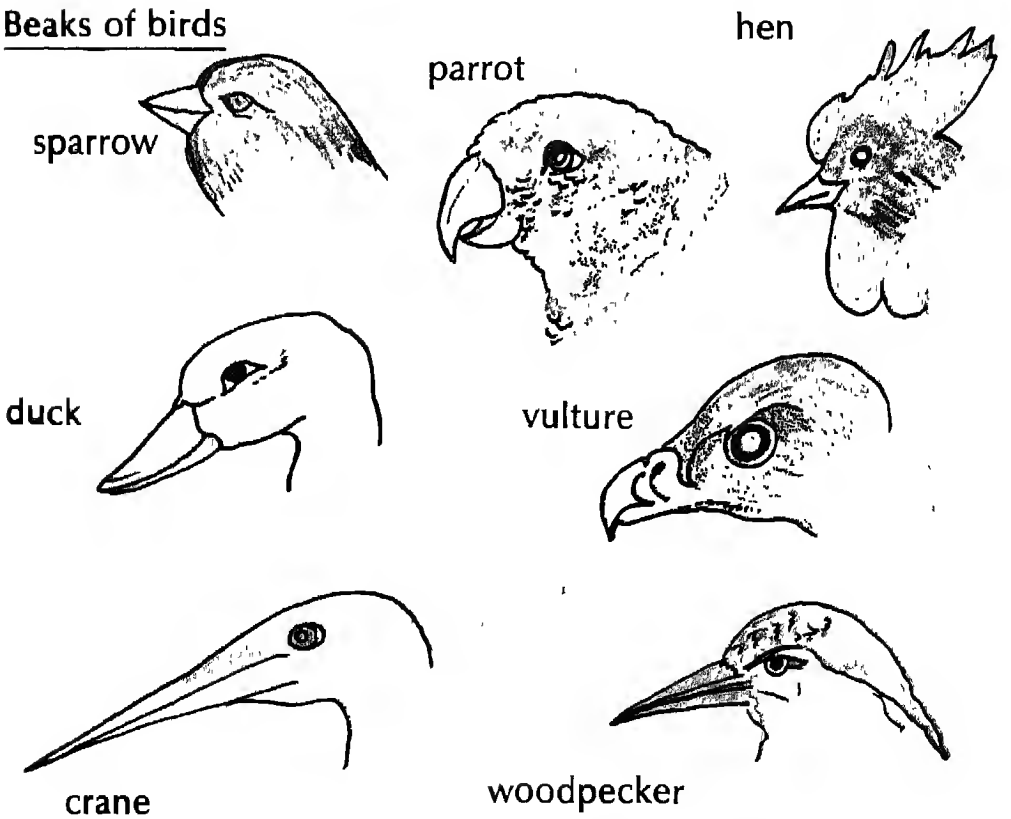
Observe five common animals in your locality. Look at their mouth parts. Observe the type of food they eat. Record your observations.

Some animals do not have teeth. They cannot chew or tear their food. How do they eat? Have you observed a house lizard catching its prey? Its soft padded feet help it to move close to the prey. Its sharp tongue darts out and the insect is swallowed quickly. Like the lizard, some other animals also swallow their food.

Name any other animal in your locality that swallows food without chewing.

Birds eat different types of food. Some birds like the vulture eat flesh. Observe closely how birds eat. Birds have no teeth. They have hard beaks.

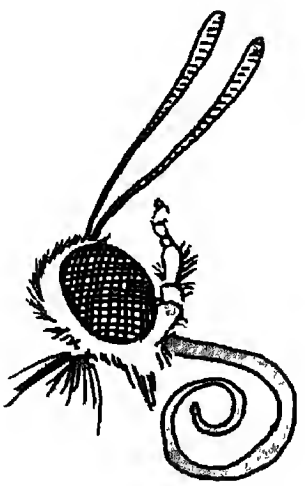
The picture given below shows the beaks of some birds. Do the beaks of these birds look alike or are they different? In what way are they different?



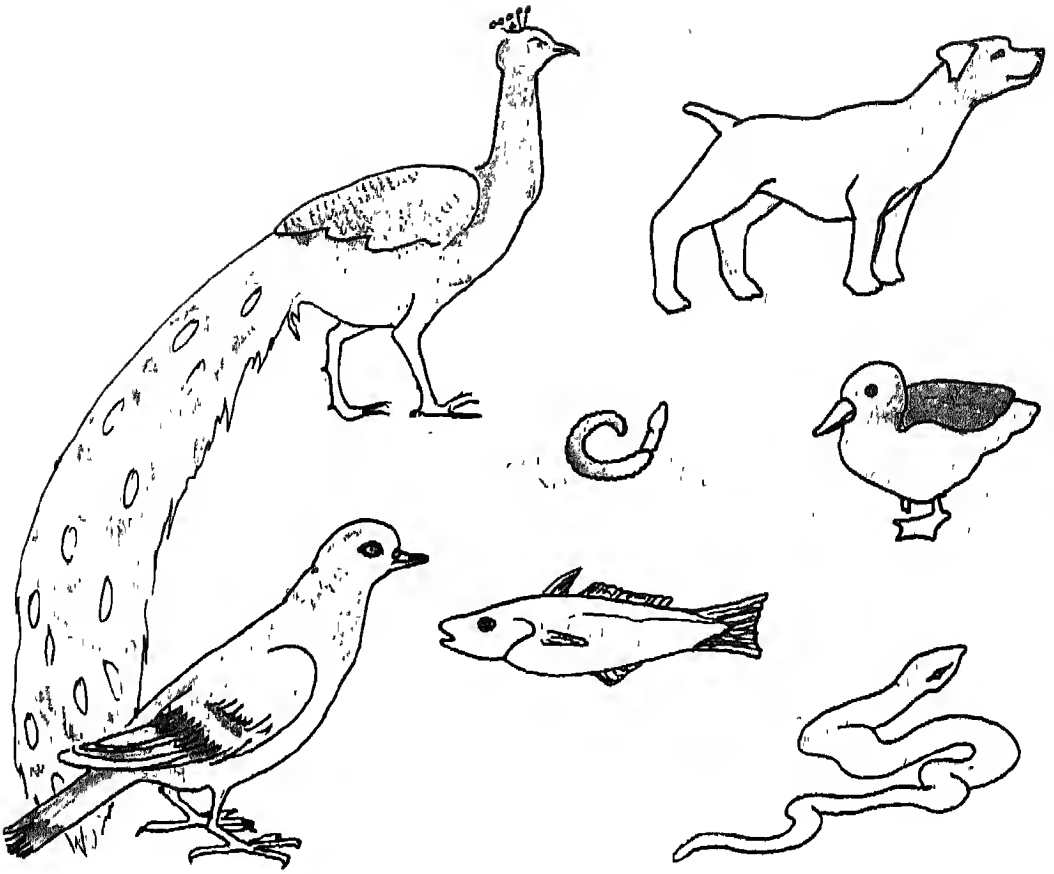
Observe the common birds in your locality. Look at their beaks. Is the beak of a sparrow and that of a mynah similar to the beak of a parrot or a woodpecker? Birds with short horny beaks eat grains and seeds. Vultures have strong, hooked beaks for tearing flesh. Ducks have flat spoonlike beaks.

How do animals such as butterflies, grasshoppers and honeybees get their food? Butterflies generally suck liquid food. Name other animals which suck liquid food.

Mouth parts of a butterfly



You have seen that different animals eat different kinds of food. They also have different ways of eating. They also move in different ways. Carefully observe the movements of different animals. Some animals run. Some crawl on the ground. Some fly. Some swim in water. Others glide on the surface of the water. Each animal has body parts which help it to move. How do we find out about this?

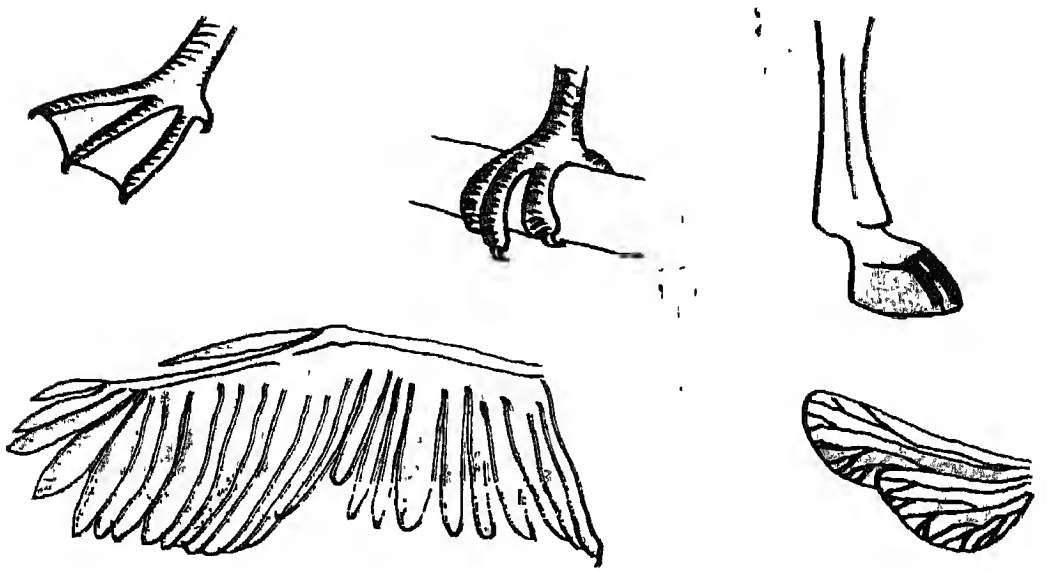


Look at these animals and find out how they move.

Name of animal	*How it moves*	*Number of legs*

What would happen if a fish had legs like an elephant? Would it be able to swim in water? How are the limbs of animals suited to their way of life?

Look at the picture. It shows the limbs of some animals.



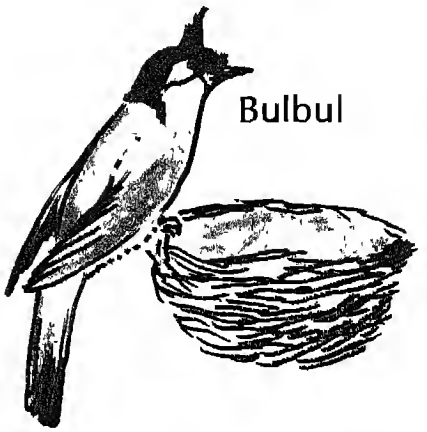
All of us need shelter. You live in a house. It protects you from heat, cold, wind and rain. A house gives you many other things. What are these? Animals also need shelter. Some animals make their own shelter.

You have often seen sparrows building their nests. They collect all kinds of things to make nests. Sparrows like to live near human beings. They build their nests in any nook and corner of a house. Pigeons also live near us. Observe these birds while they build their nests. Do they build their nests all the year round or only at certain times of the year? Why do they build their nests? What materials do they use for building their nests?

Some birds make beautiful and interesting nests. Observe the nests of some birds:

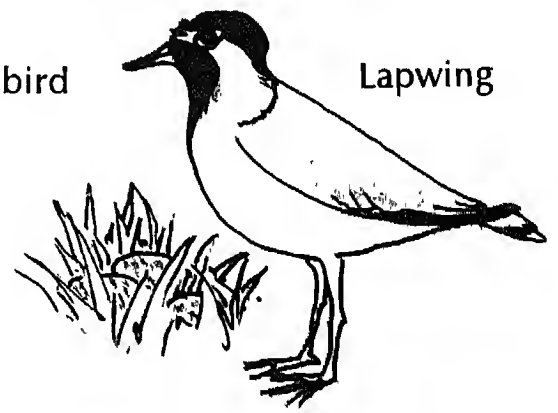
Nests of birds

Weaver bird



Bulbul

Humming bird



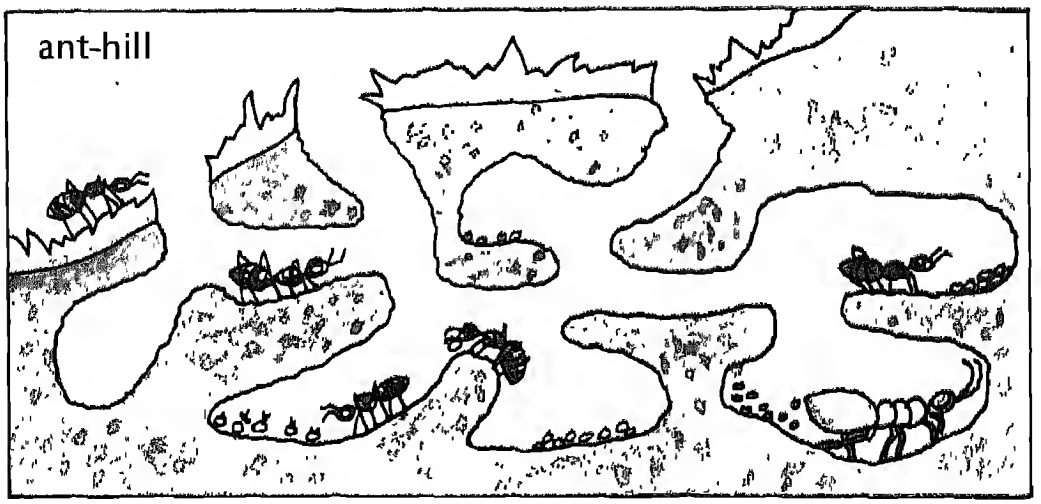
Lapwing

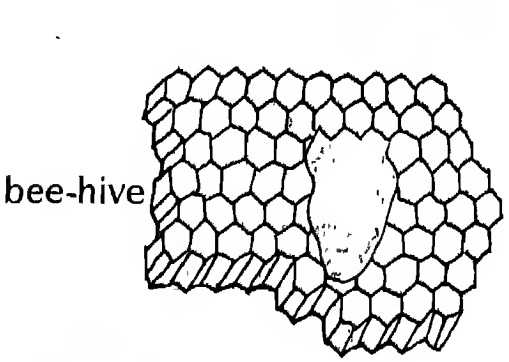
Find out the shelters of animals like monkeys and squirrels. Many animals live in natural shelters.

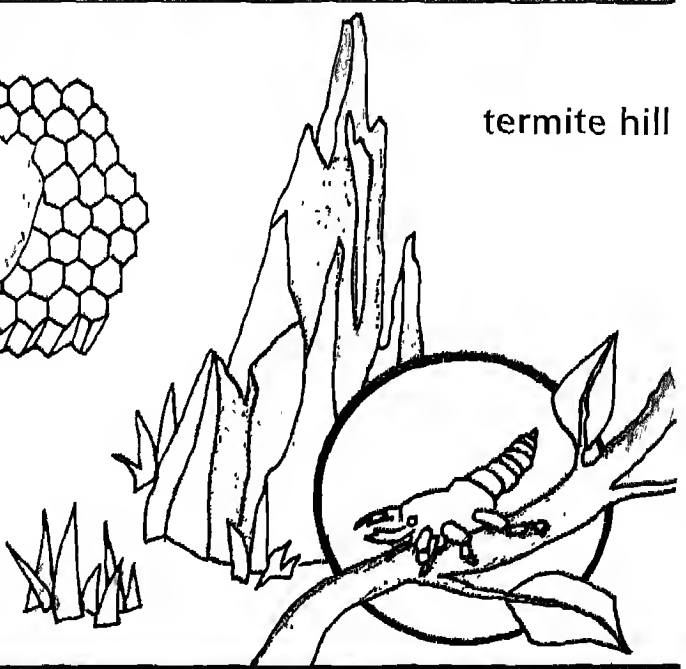
Do animals such as dogs, cats, cows and horses build their own houses? Who provides them shelter?

Some animals live underground. Some of them make their own burrows. Some live in burrows made by others. In your locality, find out the animals that make burrows in the ground. Also make a list of those animals which live in burrows made by other animals

Some animals make elaborate houses. These animals live in a colony.







TEST YOURSELF

1 Name three animals which have no teeth.
2 List two main differences between the teeth of a flesh-eating animal and a plant-eating animal.

3 Given below are names of some common animals. Groups these into flesh-eating and plant-eating animals.
Monkey, lion, squirrel, hawk, bear

4 Which of the following animals do not belong to the group. Use their eating habits as the basis for grouping.

(i) Cat, Dog, Sparrow, Tiger _____

(ii) Butterfly, Lizard, Snake, Frog _____

(iii) Horse, Monkey, Tiger, Elephant _____

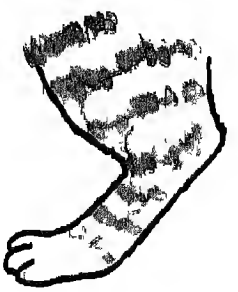
5 Given below are names of some animals and pictures of their feet.
Match the animal with the type of foot.

(i) Horse
(ii) Lizard
(iii) Cat
(iv) Frog

_____

_____

_____



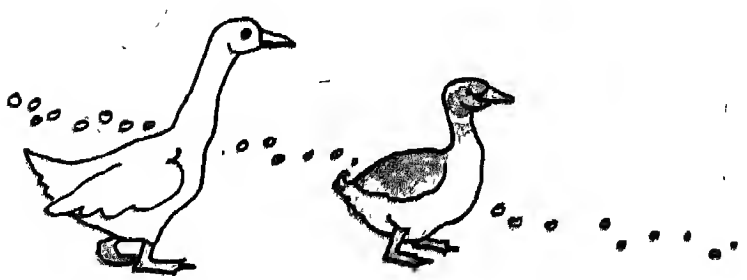
_____

6 Given below are names of some animals. Group them into the following :
Animals which build nests
Animals which build burrows
Animals which live in burrows made by others
Animals which live in natural shelters

Rabbit, Rat, Crow, Honeybee,
Parrot, Lion, Snake, Field mouse.
(You may add local examples)

THINGS TO DO

1 Observe 10 animals from your locality. Group them into the following :
   - animals which walk and run
   - animals which crawl
   - animals which fly
   - animals which swim
2 Collect empty nests of birds. Examine the nests. Find out which materials are used in building these nests.
3 Find out which animals live in or near your house. Which ones dig holes/burrows? Which ones build nests? Closely observe their habits, the food they eat and the nests they build.



CHAPTER 4

Our Body

You know that like plants and animals, human beings also belong to the living world. All living things have some common characteristics. They also have some special features which help us to distinguish one type of animal or plant from other types. We also have some special body features or structures which are common to all human beings. What are these body features?

DO THIS ACTIVITY

Observe carefully ten children in your class. Note down the body features of each child. Note down the similarities. Note down the differences. Record your observations. On the basis of your observations, try to answer the following :

- In what way do all children look similar?
- In what way do they look different?
- Do they differ in the shape of their nose, ears or eyes?
- What is the most common colour of the eyes?
- What is the most common colour of hair?

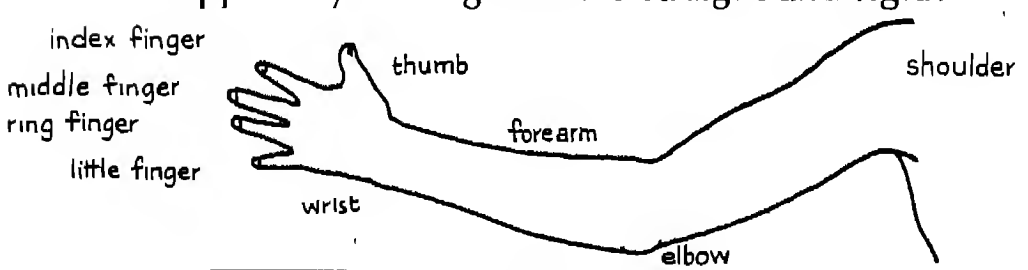
You will see that each one of you has similar body parts. But do your body parts look alike? Each one of you differs in the size and shape of your body parts. Because of these individual differences each one of us looks different from the other.

Observe carefully your mother, father, brothers, sisters and other members of the family. Note down the similarities and dissimilarities in their body parts. Do you find more similarities amongst the members of your family? Can you tell why there is more similarity between members of the same family?

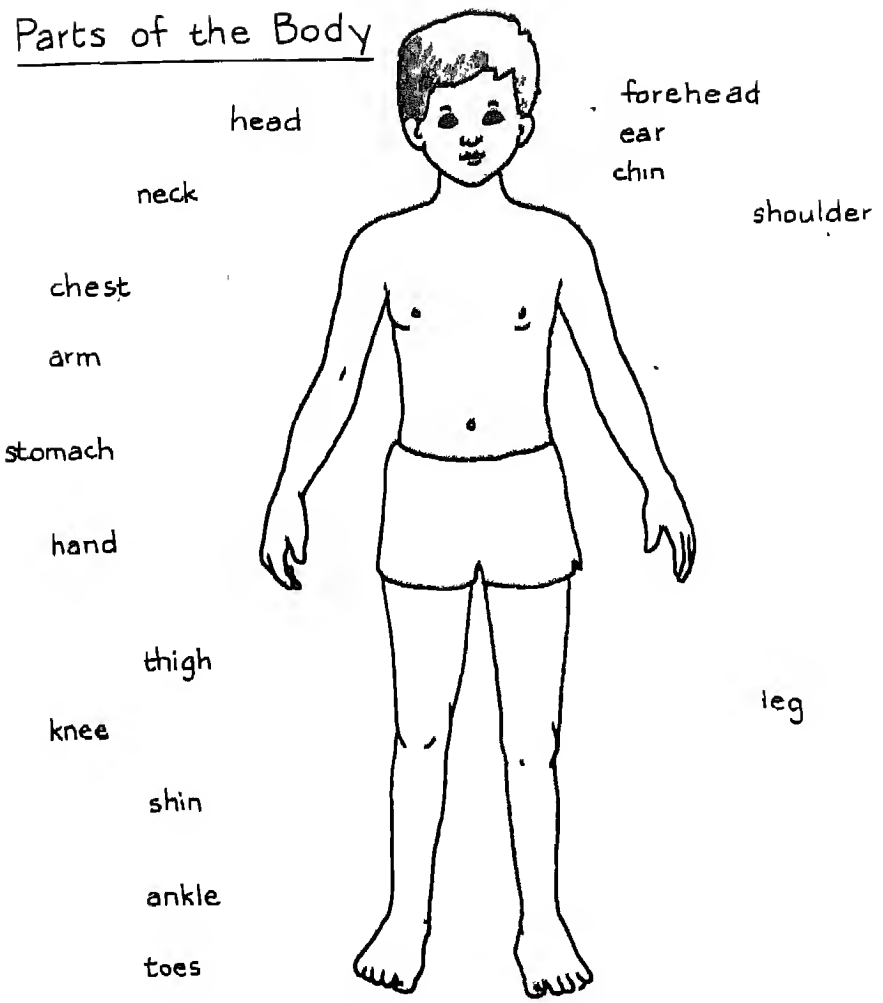
Let us now learn about the functions of the different parts of our body. Make a list of the different types of work you do with your hands. Also make a list of the types of work you do with your legs. To learn more about the functions of the body parts, let us do an activity.

DO THIS ACTIVITY

Carefully look at your arm. Write down the names of different parts of your arm. The picture given below will help you to know the names of these parts. Try out various movements of your arm. Bend the arm at the elbow. Write down the different ways in which your arms can move. In what different ways can you move your fingers. What would happen if you could not move your arms around the shoulder from left to right and from front to back? What would happen if your fingers were straight and rigid?



Like your arms, your legs also help you in many ways. Write down the types of activities you do with your legs. Look at your knee. Does it bend in the same direction as your elbow? What would happen if you



could not bend your knees? Observe yourself while walking and running. Find out what function each part of your leg performs. What would happen if your legs were straight and rigid? Would you be able to run, sit down and stand up?

You have learnt that each part of your body performs certain functions. Find out what type of movement you can make with your neck, head, chest, belly and other parts of the body that you see from outside.

We make sense of the world around us through various organs. The organs which help us to see, to hear, to smell and to taste are called sense organs. Do you know that the skin is also a sense organ? Let us learn a bit more about these sense organs.

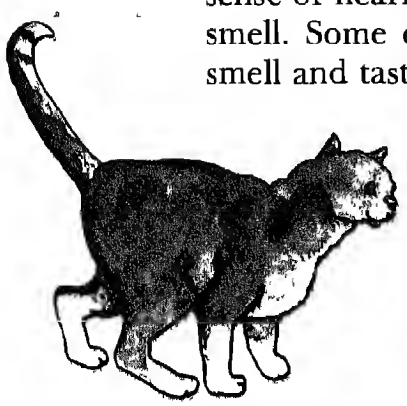
DO THIS ACTIVITY

Put a blindfold to cover the eyes of one of your classmates. Ask him to stand in the centre of the classroom. The rest of you can stand in a circle around him as shown in the picture.

The children in the outer circle should have something such as a stick, drum, etc. to make sound. Ask the child in the centre to close one of his ears. Let a child make a loud sound. Ask the child in the centre to identify the direction of the sound. Now ask another child to make a sound. How well can your friend in the centre make out the direction of the different sounds? You can repeat this activity a number of times by taking turns, by replacing the child in the centre.

You would find that some of you could judge the direction of the sound more correctly than others.

Animals such as cats and dogs have a very fine sense of hearing. They also have a very fine sense of smell. Some of us have a very fine sense of touch, smell and taste.

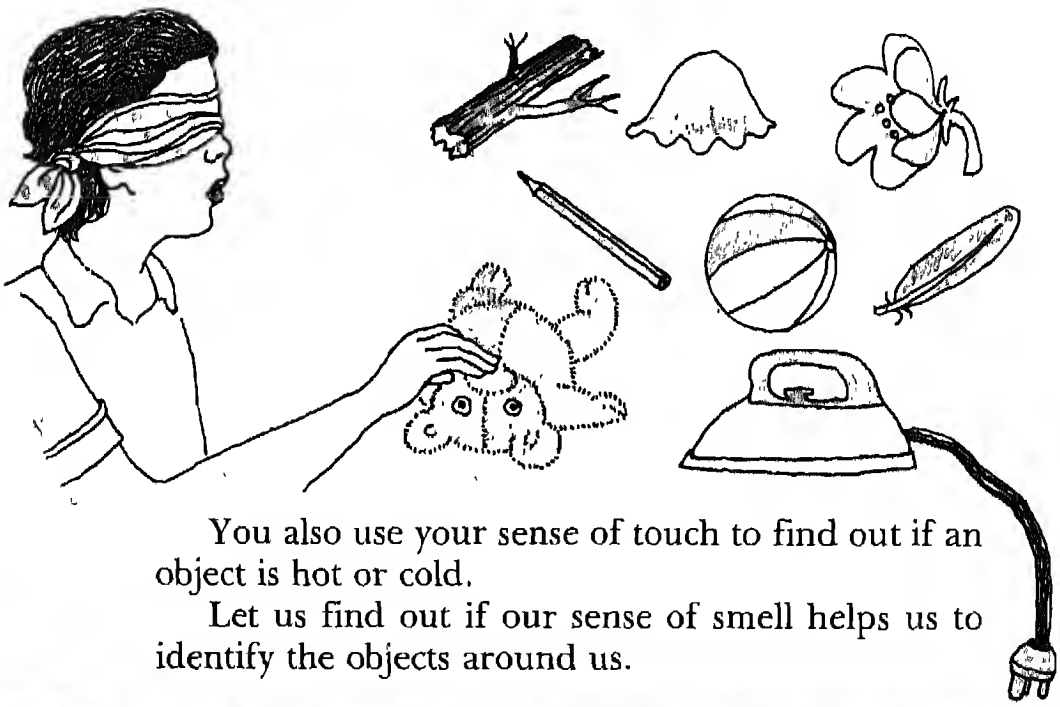


You must have played the game Hide-and-Seek (aankh micholi). While playing this game you put on a blindfold on your eyes and try to locate your friend by the sound he/she makes. Blind persons are able to find their way around by feeling things. What other senses do they use to find their way around?

How does the sense of touch help us to find out about things around us?

DO THIS ACTIVITY

Put on a blindfold. Let one of your friends place some objects on a table. Try to describe the objects by touching them. You can classify these objects into different groups, such as rough or smooth, round or sharpedged, hard or soft, heavy or light. Find out what else you can say about these objects. To identify these objects what other sense organs will you use?



You also use your sense of touch to find out if an object is hot or cold.

Let us find out if our sense of smell helps us to identify the objects around us.

DO THIS ACTIVITY

Collect five items such as onion, garlic, a rose or any other flower, leather and a crushed green leaf. Put each item in a separate paper bag. Ask your friend to smell each bag and identify the item by the smell. Let him write down the name of each item. Now ask him to open each bag and check if he has identified each item correctly.

DO THIS ACTIVITY

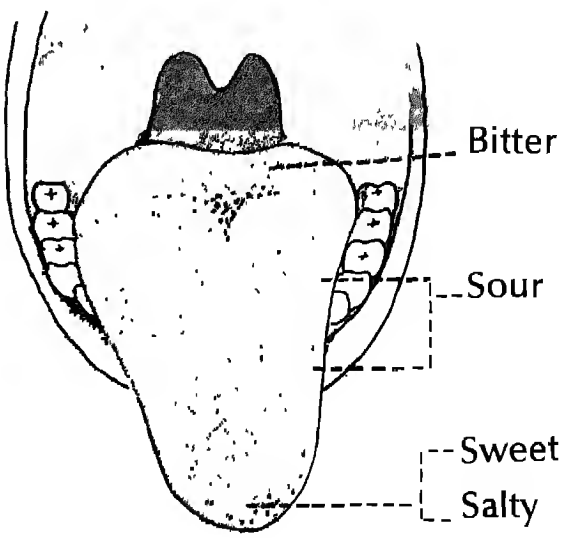
Ask your friend to close his eyes. Put a pinch of salt, a pinch of sugar and a few drops of lemon juice on his tongue, one by one, after some interval. Ask him to identify each item by its taste. Repeat this activity with other children. Compare your experiences.

Now make a list of food items that taste salty, sweet, sour and bitter. Write them in the table given below.

Taste	*Food Items*
Salty	
Sweet	
Sour	
Bitter	

Your tongue has different areas which help you to taste different things. The picture given below shows these areas.

Picture of tongue



Our tongue helps us to taste different things, sweet, sour, bitter and salty.

Next time you eat some food, try to note which part of your tongue helps you to taste salty, sour, sweet and bitter food.

Our sense organs are very important. You must take proper care of them. You should always keep them clean. Wash your eyes, mouth and ears with clean water everyday.

TEST YOURSELF

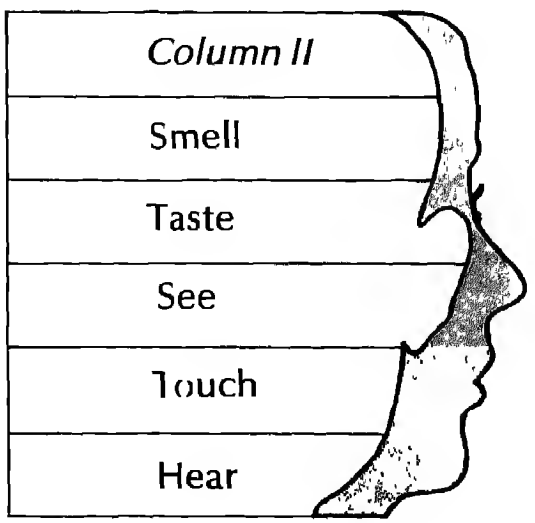
ns useful to us?

on the part of the body that does oup.

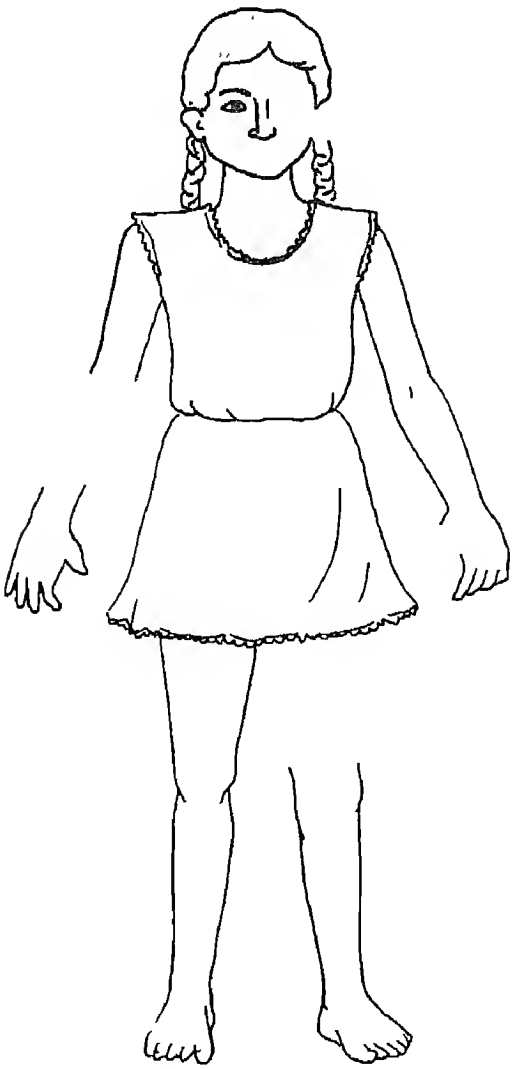
k, elbow

ear

nse organs in column I and their II. Match the organs with their



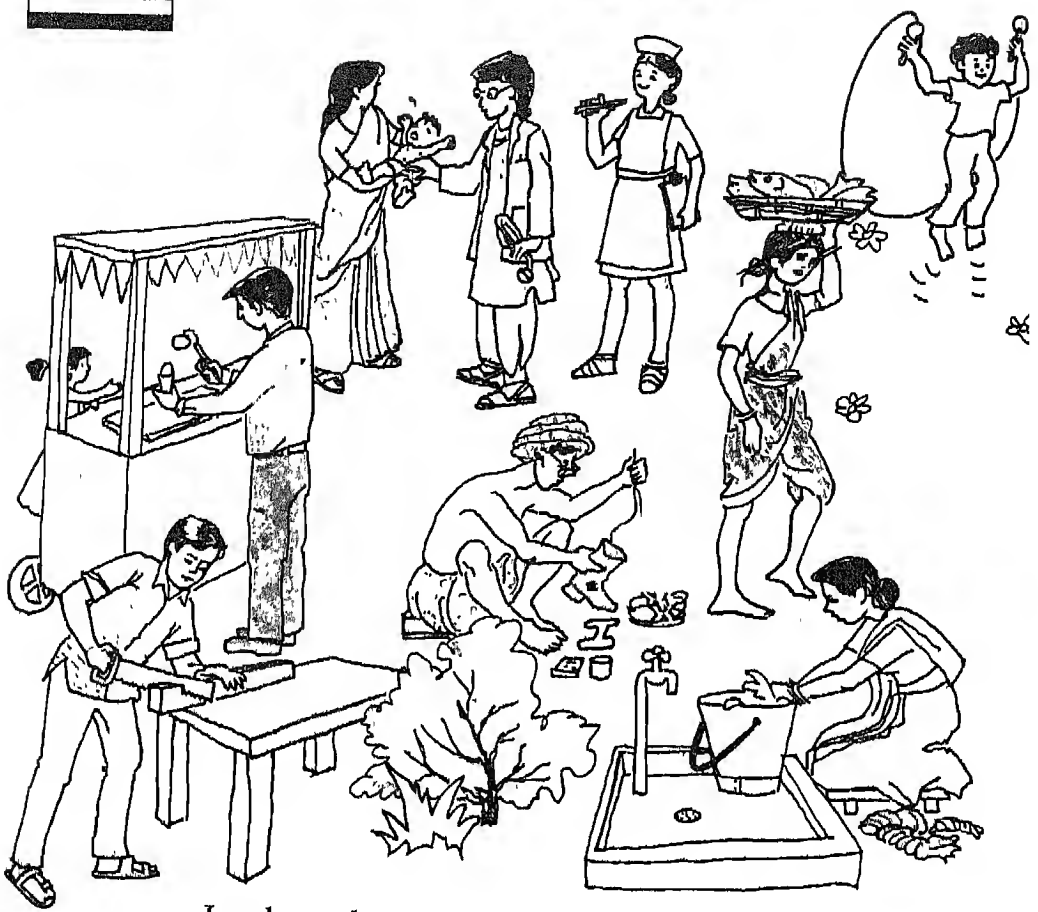
4 Given below is a diagram of a human body with some parts missing. Complete the picture by drawing the missing parts.



5 A basket full of vegetables is kept in a c
room. You are asked to pick up o
Which sense would you use to find the

CHAPTER 5

Our Food



Look at the picture on this page. You find some people are working, some are playing and some are engaged in some other activities. After playing or working for a long time we feel tired. When we rest, we feel better. When we are hungry we also feel tired. After eating food we feel better. We all need food. Food gives us the capacity to do work. This capacity to do work is called energy. We need energy for doing a variety of work. The food we eat gives us this energy. We need food, rest and exercise to keep the body healthy and fit.

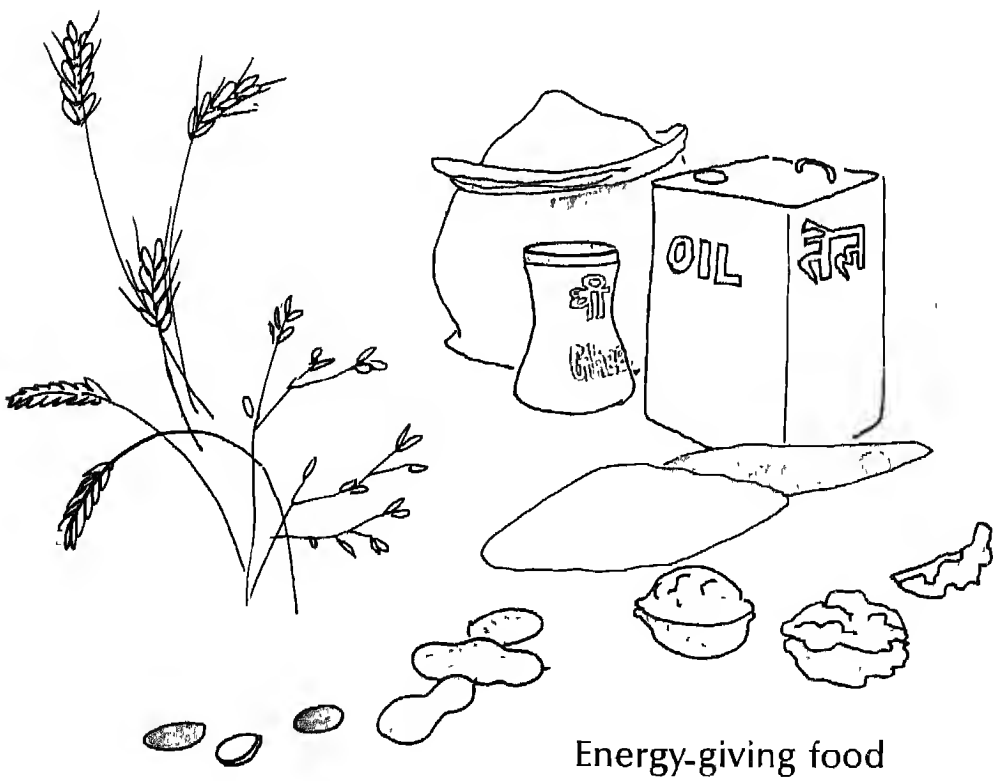
How does food help us to keep healthy?

DO THIS ACTIVITY

Make a list of the food items you eat everyday. What food do you eat in the morning, during the day and at night? Do you eat only one kind of food or a variety of foods?

You may be eating grams/lentils, *chapati* or rice and vegetables. Some of you may be eating *jawar* or *bajra* or *ragi*. You also eat different types of grams and different kinds of vegetables Thus you see we generally eat different types of food.

Paddy, jawar, bajra, ragi and wheat are called cereals. These foodstuffs provide us with energy.

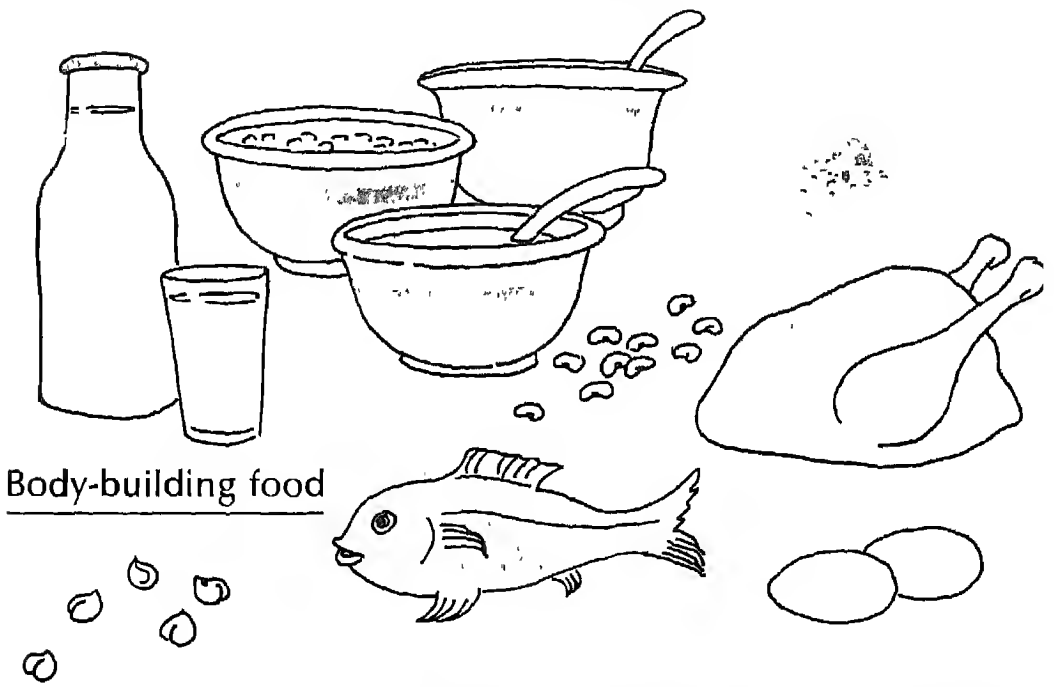


Energy-giving food

Foodstuffs such as sugar, *gur,* potato, sweet potato, tapioca and yam are rich sources of energy. Besides these, fats, oils and butter also provide us with energy. All these foodstuffs are called energy-rich food. Name some energy-rich food found in your locality.

For work and play we need energy. But we also need food for growth We need food for the maintenance of our body. It helps to restore the wear and tear of the body.

Look at the picture given below. It shows some food items that help us to grow.

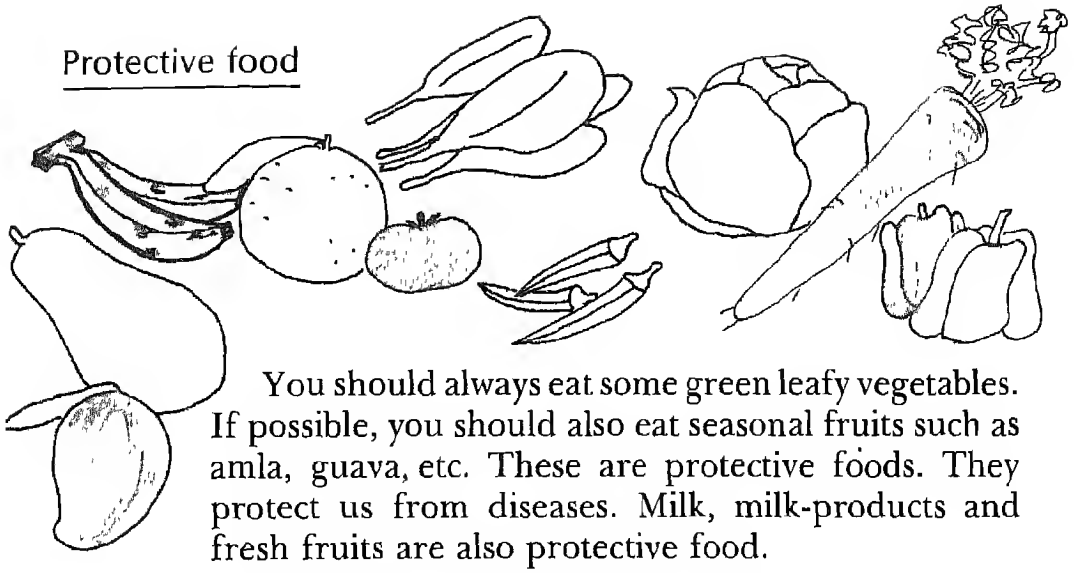


Body-building food

These are called body-building food. They help in growth of our body. Name some food items which help you to grow.

Banana, orange, guava, carrot, lady's finger (*bhindi*), *tinda, palak,* other fruits and vegetables are also useful for us. These contain substances which help us to get protection against diseases. These foods belong to a group called protective food.

Protective food



You should always eat some green leafy vegetables. If possible, you should also eat seasonal fruits such as amla, guava, etc. These are protective foods. They protect us from diseases. Milk, milk-products and fresh fruits are also protective food.

You must eat all kinds of food. Eat food which will give you energy, help you to grow, and to fight against diseases. Milk is a complete food. It helps you to grow, gives you energy and protects you from diseases.

It is not enough to eat food from all these groups. You should also drink plenty of water. Your food should also contain fibrous food, such as carrot, radish, coarse grains and leafy vegetables. These contain things which do not get digested. These provide bulk to the food. They also help in bowel movement. These things are called roughage.

We generally cook most of the food items before eating them. Why do we cook them? Let us find out.

DO THIS ACTIVITY

Soak some rice in water. Try to chew it. Does it taste good? Compare the taste with that of cooked rice. Now try chewing some pieces of clean and washed vegetables such as potato, beans, brinjal, etc. Make sure you do not swallow them. How do these taste?

You find that cooking improves the taste. It also makes the food softer and easy to digest. Write down in your note book other reasons why some food items should be eaten only after cooking.

We do not eat all kinds of food only after cooking. Some food items are eaten raw. Name some of these food items.

DO THIS ACTIVITY

Look at the picture given below. You will find some common foodstuffs.

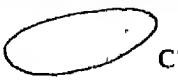

rice


bhindi


wheat


cauliflower


carrot

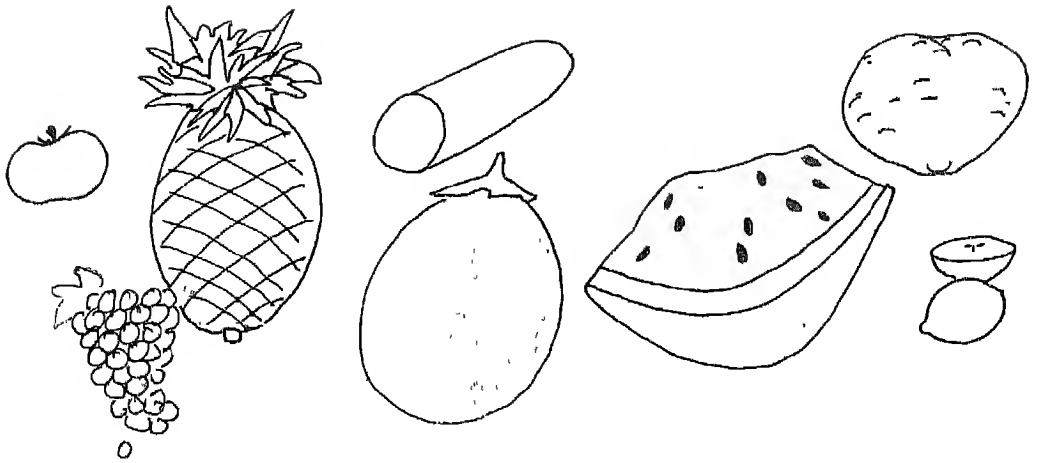

cucumber


banana

Group these foodstuffs into three groups as shown below :

Food eaten only after cooking	Food eaten raw	Food eaten both cooked and raw

List out locally available food items which belong to the above three groups. Write these in the above table.

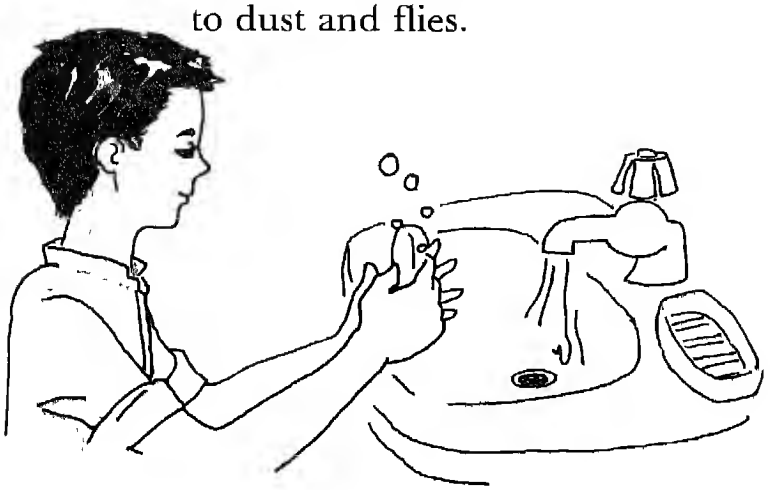


You must know that most fruits are eaten raw. Some fruits are eaten along with their skin and some after peeling the skin. Name the fruits which are eaten along with their skin. You should always wash fruits and vegetables in clean water before eating them.

You should wash vegetables before cutting them. If vegetables are washed after cutting, protective substances (vitamins) are lost. These protective substances get washed away with water. In case vegetables are to be peeled, they should be washed before peeling.

For good health you should eat a variety of food.

You must clean your hands before handling any food item. Avoid eating food that has been exposed to dust and flies.



Look at the picture given below. Would you like to eat the food from Shop 1 or Shop 2?

xposed to dust and flies carries disease
ı may suffer from diarrhoea, cholera and
· diseases if you eat such food.

TEST YOURSELF

1 Name any three cereals.
2 Why is some food called protective food?
3 Why is cooking of some food items necessary? Give three reasons.
4 Why should fruits and vegetables be washed before eating?
5 Put a tick (√) mark on the food that does not belong to the group.
   (i) Cucumber, carrot, banana, brinjal
   (ii) Guava, wheat, rice, lady's finger
6 Put a tick (√) mark on the statement which is most appropriate.

   Energy for our work and play is obtained mainly from
   (i) pulses
   (ii) cereals
   (iii) vegetables
   (iv) fruits
7 Given below are the activities related to preparation of vegetables. Rearrange them in a correct sequence by writing Nos. 1,2 and 3
   (i) Peeling the vegetable
   (ii) Cutting the vegetable
   (iii) Washing the vegetable
8 Given below are names of some food items. Group them into energy-giving food, body-building food and protective food.

   Orange, potato, moong dal, rice, milk, fish, sugar, amla, palak
9 Draw three food items which can be eaten raw.

THINGS TO DO

1 Visit the market place. Observe different food items sold there. Make a list of 30 food items. Group them into energy-giving food, body-building food and protective food.

2 Plan a weekly food chart from the locally available foodstuffs. Select foodstuffs from all the three food groups.

3 Make a list of food items you eat every day. Group these food items into energy-giving food; body building food and protective food. Find out if you eat food from all these groups.

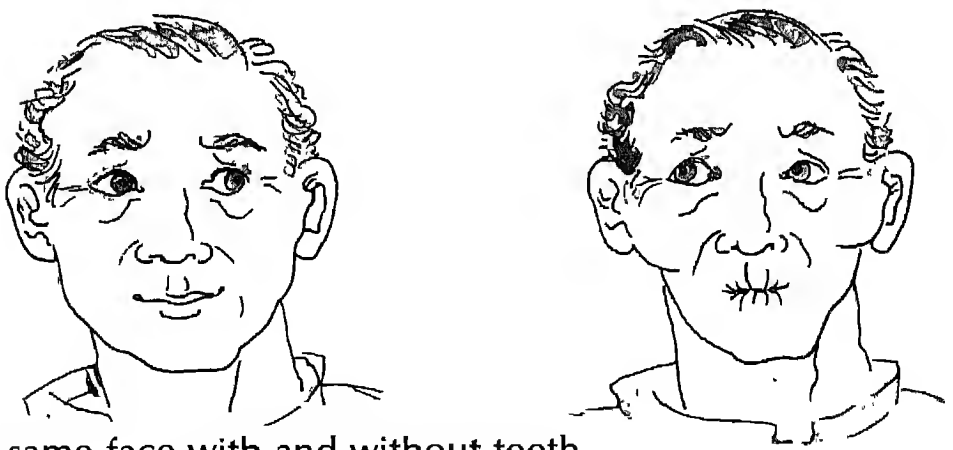
CHAPTER 6

Care of the Teeth

How would you feel if you had no teeth? Most of you would perhaps say that you would not be able to enjoy your food. You will not be able to chew any solid food such as juicy sugarcane, raw vegetables, fruits and nuts. So you will miss out eating many good things in life.

You know that apart from chewing food, teeth have many other functions. In what other ways are teeth useful to us?

Look at the picture on this page. You will see two faces of the same man. Look carefully. What differences do you see in the faces? Find out which of the faces is without teeth.



The same face with and without teeth

You must have seen a very old man or woman who has lost all his or her teeth. What do their faces look like? Find out from them how they looked when they had their teeth. Can you imagine how you would look if you lose all your teeth? Besides giving shape to the face, teeth have another function. What is it?

DO THIS ACTIVITY

Try to speak without letting your tongue touch your teeth. Can you speak properly? Speak a few different words. Write down those words which you find difficult to utter without the tongue touching the teeth. Write down those words which you cannot utter at all without the tongue touching your teeth. Collect all these words and write them in table as given below.

Words difficult to utter without the tongue touching the teeth	*Words which cannot be uttered without the tongue touching the teeth*

You have seen from the above activities that teeth perform very important functions for you. Teeth help to chew food, give shape to your face and enable you to speak properly. Do all our teeth look similar? Do they perform the same functions?

DO THIS ACTIVITY

Look at yourself in the mirror, open your mouth and carefully observe your teeth. In what way do teeth vary in size and shape? Observe the front teeth, side teeth and teeth at the end of the jaw. How do

they look? The front teeth are flat and thin, with a sharp edge. Count their number in the upper and lower jaws. The side teeth are long and pointed. Count the number of side teeth. The teeth at the end of the jaw are broad, strong and flat. Count their number.

Each kind of tooth performs different functions. Look at the picture. It shows all the three types of teeth.

Types of Teeth

Cutting teeth Tearing teeth Grinding teeth

Thin, flat, front teeth are cutting teeth. Sharp, pointed side teeth are tearing teeth. Broad, flat teeth at the end of the jaw are grinding teeth. When we eat food, these three kinds of teeth help us to cut, tear and chew the food.

Did you always have teeth in your mouth? A newborn baby has no teeth. When the baby is six to seven months old, teeth begin to appear. These are called *milk teeth*. When the child grows older, he loses the milk teeth. Some of your classmates have already lost their milk teeth. When the milk teeth fall out new teeth grow in their place. These are called *permanent teeth*. How many milk teeth and permanent teeth have you got?

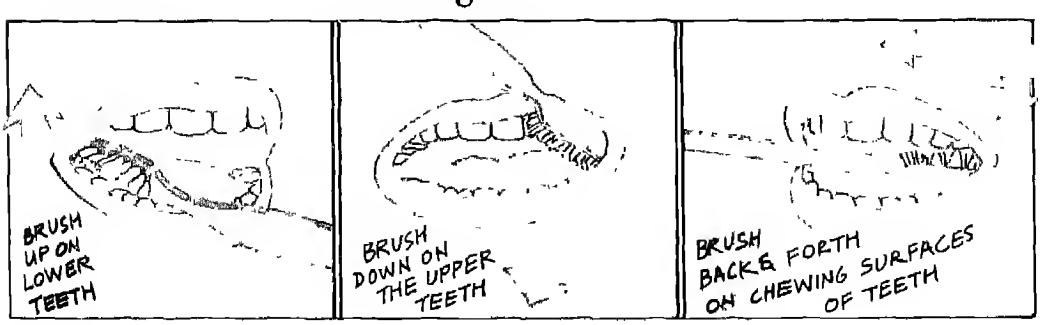
DO THIS ACTIVITY

Observe the teeth of your classmates. Find out how many milk teeth they have lost. Count the number of milk teeth and permanent teeth of each child. Record your findings and complete the table given below.

Name of your classmate	*Number of milk teeth*	*Number of permanent teeth*	*Total No. of teeth present*

You should take special care of your teeth. If you lose your permanent teeth, no new teeth will grow in their place. To keep your teeth and gums healthy you should brush your teeth and massage your gums every day. Look at the picture given below. It shows the proper method of brushing the teeth.

Correct method of brushing teeth



What happens when you do not clean your teeth properly? Look at the picture given here.

A child with bad teeth

Do you want to suffer like this child? Look at his teeth. Some are black and broken. Bad teeth cause toothache. Often the toothache is unbearable. Bad teeth also cause indigestion and stomach trouble. When you have bad teeth you cannot chew your food properly. Why do teeth decay?

DO THIS ACTIVITY

Rinse your mouth with water. Clean your hands. Now eat some *roti*, biscuit or any other food. Feel the teeth with your tongue. Do you find something sticking between your teeth? What is it?

If you do not wash your mouth and clean your teeth after eating, the food particles decay in the mouth. This may lead to tooth decay. When the tooth is badly damaged it gets loose from the gum and may even fall.

You must always brush your teeth after every meal. You should also clean your teeth before going to bed. But for having healthy teeth, it is not enough to clean them. You should also exercise your gums. Massage the gums with clean fingers. Eat fibrous fruits and vegetables like radish, carrot, guava, drumstick, salad and turnip. These will help to exercise the gums. They will also make your teeth healthy.

TEST YOURSELF

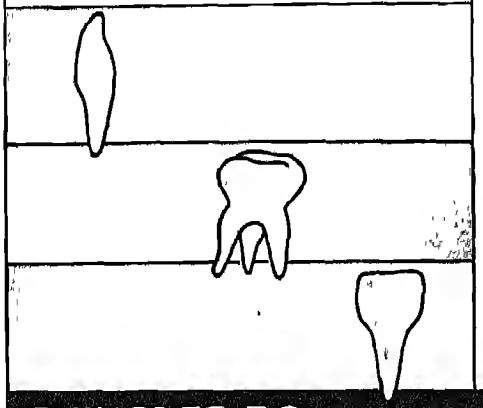
1 State the different functions of teeth.
2 Why do people who have lost their teeth find it difficult to speak properly?
3 What are the three important causes of tooth decay?
4 Given below are some statements. Put a tick (√) mark against the true statement. Put a cross (×) mark against the false statement.

(i) Grinding teeth are sharp, long and pointed.
(ii) In our lifetime we get three sets of teeth.
(iii) To exercise the gums we should take fibrous food.
(iv) Sweets and sticky food are good for teeth.
(v) We should brush our teeth before eating food.

5 In the following questions four possible answers are given. Put a tick (√) mark against the most correct answer.

(i) Tooth decay leads to
  (a) Indigestion and stomach trouble
  (b) Foul smell and toothache
  (c) None of the above
  (d) (a) and (b) above
(ii) The number of front teeth in each jaw is :
  (a) 8 (b) 2 (c) 3 (d) 4
(iii) The number of side teeth in each jaw is :
  (a) 4 (b) 1 (c) 2 (d) 6
(iv) Milk teeth begin to appear when the baby is :
  (a) one year old
  (b) one to two months old
  (c) six to eight months old
  (d) three to four months old

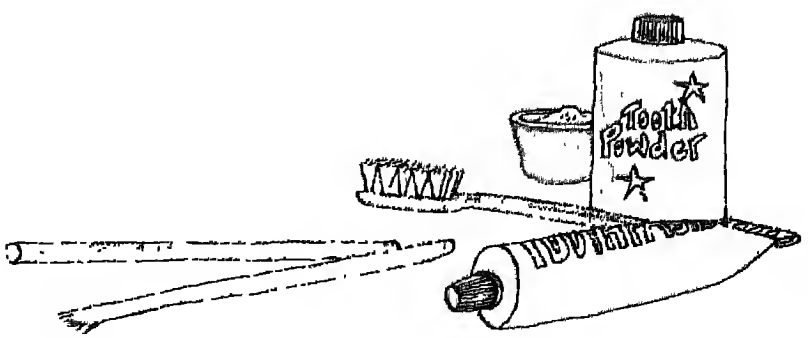
6 Given below are pictures of three kinds of teeth (in column 1) and their functions (in column 2). Match the teeth with the function.

Column 1	Column 2
	Cutting
	Tearing
	Grinding

THINGS TO DO

1 Visit ten families in your locality. Collect information on types of materials (toothpaste, *datun*, tooth powder, etc) they use for cleaning teeth. Find out the most common and least common materials used for cleaning teeth.

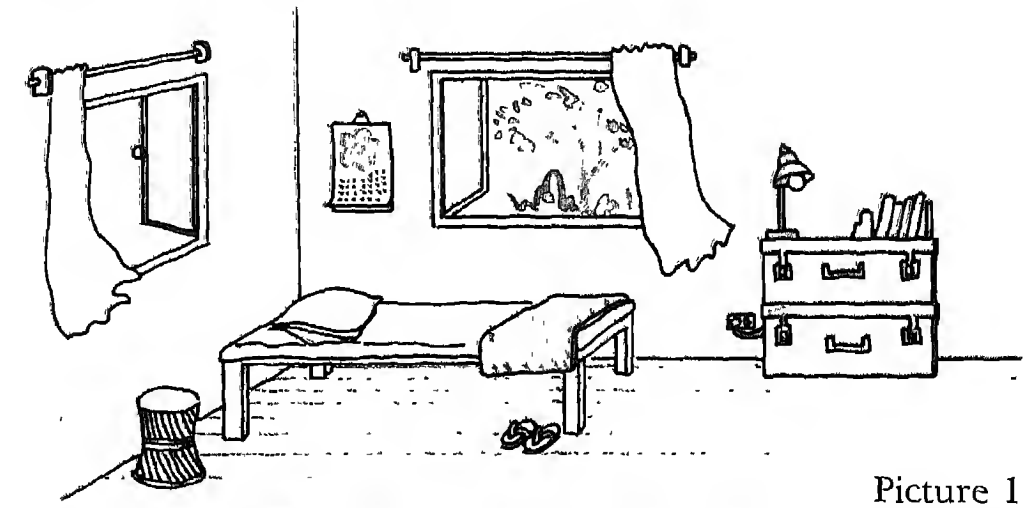
2 Make a survey of your classmates. Find out about their habits of cleaning teeth. Find out which of your classmates have bad teeth. Relate the condition of their teeth with their practice of cleaning them.



CHAPTER 7

Cleanliness of Surroundings

Look at the pictures given below. What differences do you find in them?



Picture 1

Picture 2

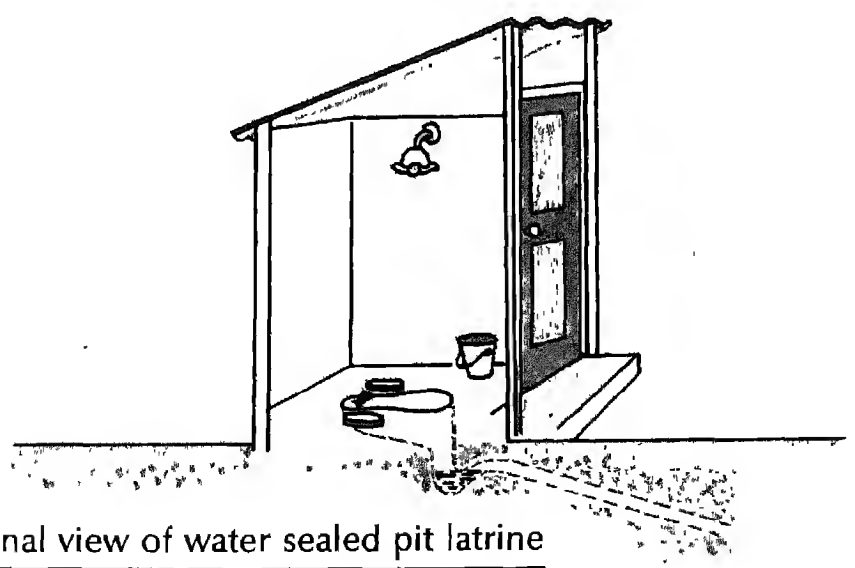
In which house would you like to live—the house in Picture 1 or the one in Picture 2?

Pleasant and clean surroundings are liked by all of us. Are our surroundings always clean? Who makes them dirty? Who throws garbage here and there? Who spits, urinates and defecates in the open? We all do it at one time or the other.

What happens when we defecate in an open place? People might step on it. Small children might play with it unknowingly. Flies might sit on it and then sit on exposed food. It helps to carry germs of diseases such as diarrhoea and cholera. Would you like to eat such food?

Every year, a large number of children in our country die due to diarrhoea. Repeated diarrhoea also makes children weak. They do not grow properly and may suffer from other diseases.

How can we prevent this? The best way is to defecate in a sanitary latrine. But all of us may not have sanitary latrines in our houses. In such cases, people can get together and build common sanitary latrines. One type of sanitary latrine is a water sealed pit latrine.



Sectional view of water sealed pit latrine

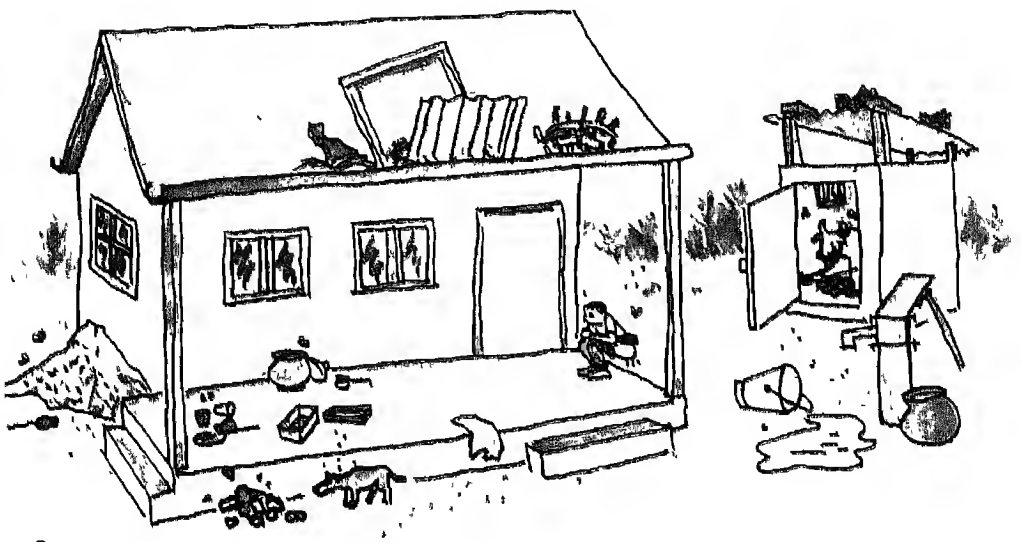
To make this type of latrine, a pit is dug. The pit should be dug away from sources of drinking water. The pit is joined to the latrine seat by means of a bent pipe full of water. Other types of latrines are trench latrine and dry pit latrine. You should always have enough water to flush out the human excreta.

If there is no latrine, one may have to defecate in the open. While defecating in the open, one should at least practise the following :

- Select a place away from sources of drinking water.
- Cover the stools with mud. This will prevent the spread of germs.

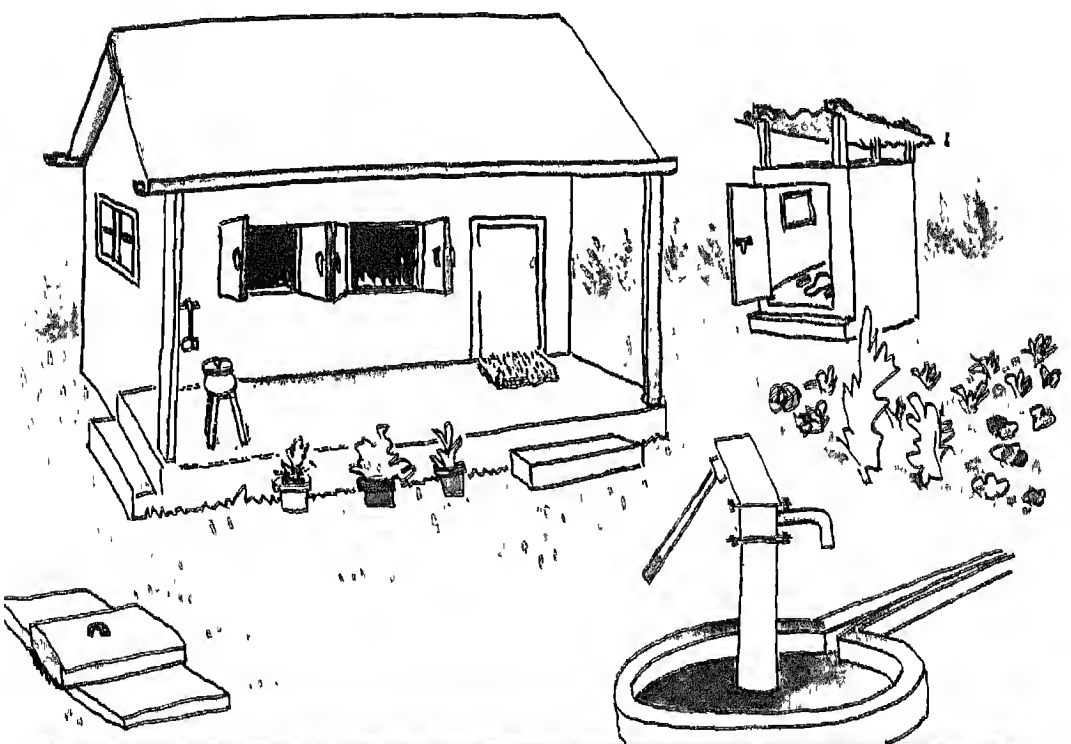
After defecation, hands, fingers, nails, feet and legs should be washed properly with clean water. For washing hands you may use ash if soap is not available. You should also clean other parts of your body regularly. For healthy surroundings it is not enough to take care of human excreta only. What other things make our surroundings dirty?

Look at the picture given below. What do you see? Look at the heap of garbage, the dirty water in puddles and flies and mosquitoes everywhere.



Compare the picture on the left with the picture given below. In what way is this house different from the earlier one? How is waste water disposed of ?

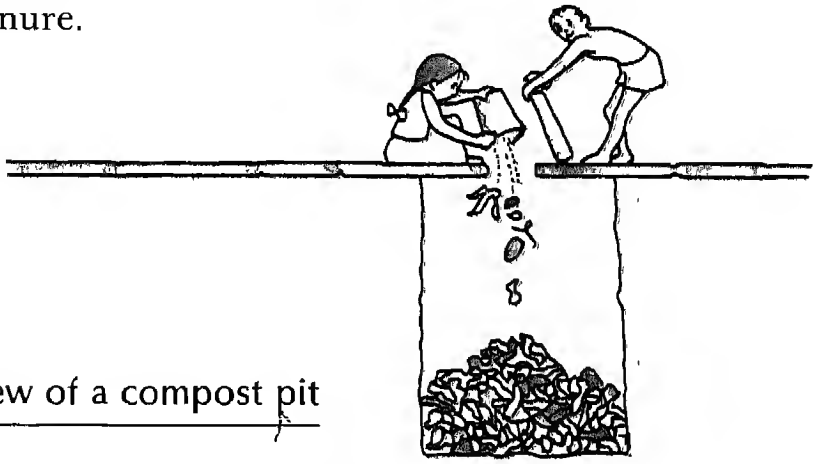
When there is no proper disposal of garbage, it attracts flies. Waste water becomes a breeding-place for mosquitoes. Is your locality clean and tidy?



DO THIS ACTIVITY

Visit five houses in your locality including your own. Make a list of the type of garbage in each house. Is there a proper place for dumping the garbage? How is the garbage disposed of? Find out if there are any drains. If not, how is the waste water disposed of?

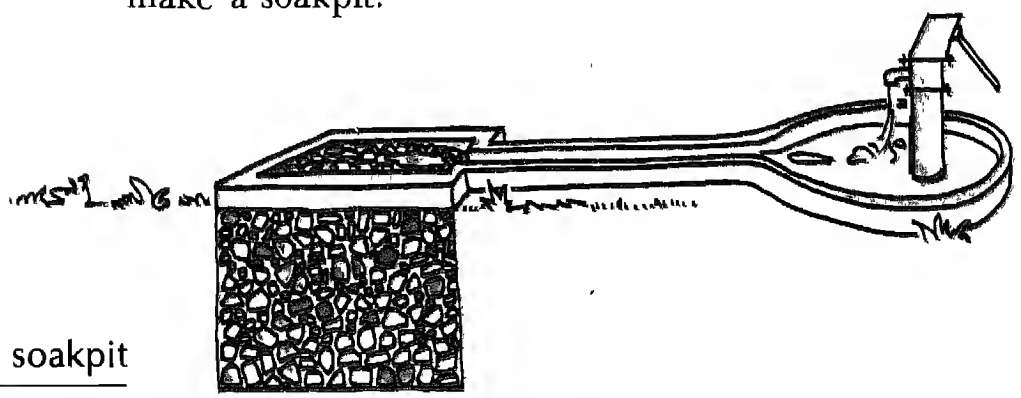
You may find that in some houses there is no proper disposal of waste water and garbage. One of the ways of disposing of garbage is to make a compost pit. The garbage from the house and its surroundings is dumped in the pit. The pit has a narrow opening. The opening should be kept covered. After a few months the garbage will decay. It can then be used as manure.



Sectional view of a compost pit

How can we get rid of waste water? The waste water from houses should not be allowed to stand. Water should be allowed to flow. If there are no drains a 'Kuccha Nala' can be dug. Waste water may be allowed to flow into this. It can be used to water plants in the kitchen garden, if there is one.

Another way of disposing of waste water is to make a soakpit.

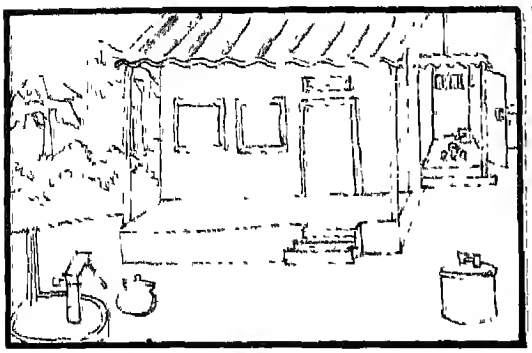


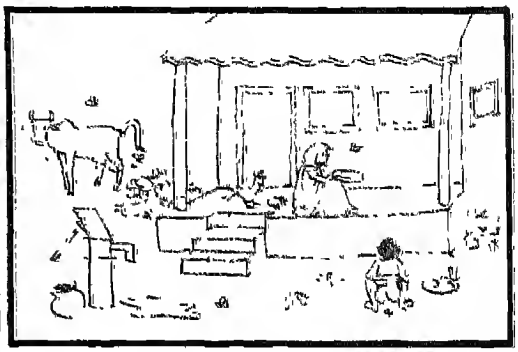
A soakpit

TEST YOURSELF

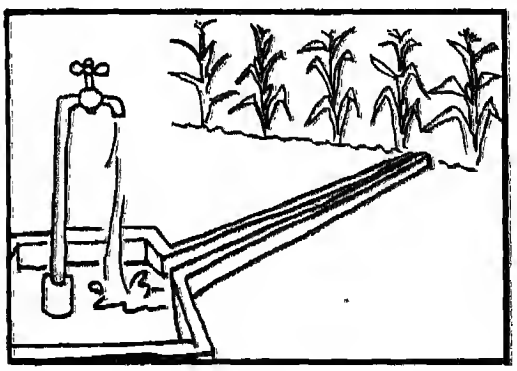
1 Give three reasons why it is harmful to defecate in the open.

2 Study the pictures given below. In which house are the people likely to fall ill?





3 Study the pictures carefully. Put a tick (√) mark on the picture showing proper disposal of waste water.



4 Given below are some statements. Put a tick (√) mark on the true statement. Put a cross (×) mark on the false statement.

(i) When garbage is disposed of in an open pit, it prevents disease.

(ii) Disposal of waste water in a soakpit will prevent breeding of mosquitoes.

(iii) Water sealed pit latrines should be built near the source of water.

(iv) Exposed human excreta help to

5 In the following statements four possible conclusions are given. Put a tick (√) mark on the most correct answer.

(i) It is dangerous to keep waste water standing in open pools because
   (a) it looks ugly.
   (b) it smells bad.
   (c) it provides a breeding-ground for mosquitoes.
   (d) it provides a breeding-ground for flies.

(ii) Proper method of disposal of vegetable and animal waste is
   (a) putting it in an open pit
   (b) putting it in a compost pit.
   (c) burning it in the open.
   (d) putting it in a heap outside.

(iii) A soakpit is made for the disposal of
   (a) grabage
   (b) human excreta
   (c) animal excreta
   (d) waste water

THINGS TO DO

1 Make a survey of 10 families in your locality. Find out the types of latrines they use.

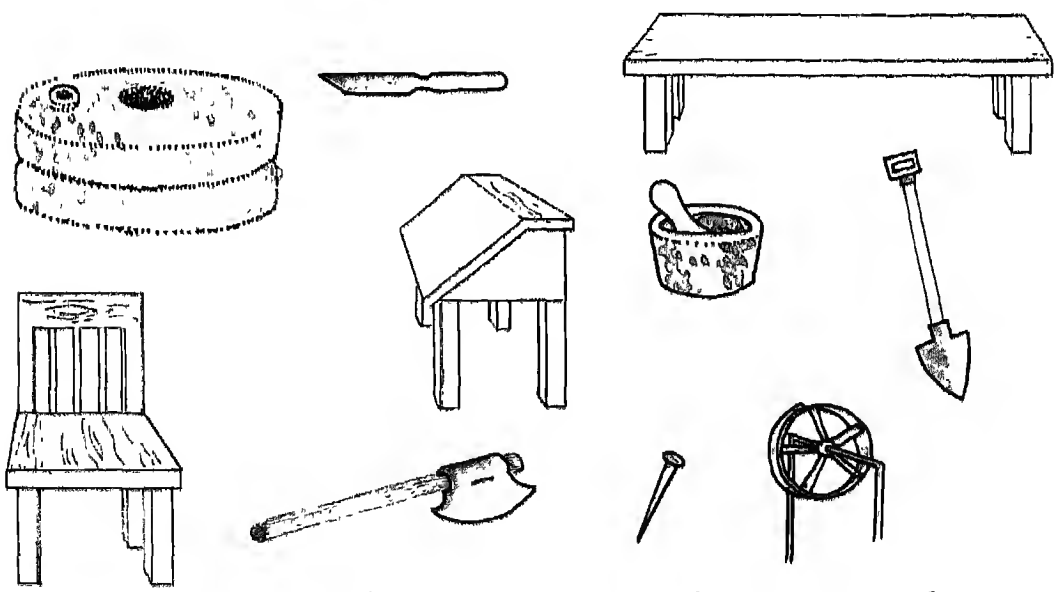
2 With the help of your teacher and older children make a compost pit in your school. Make a list of the types of wastes found in the school. Name the waste materials which can be disposed of in the compost pit. Find out how other types of wastes are disposed of.

CHAPTER 8

Materials Around Us

You are already familiar with different materials. The world is made up of a variety of materials—rocks, soil, water, air and so on. We use a large number of materials every day. The food we eat and the clothes we wear contain different materials. Different materials are used to build and furnish our houses.

We also use many materials to make different kinds of objects. Some of these objects are shown in the picture. Name each object. Group the objects made of the same material.

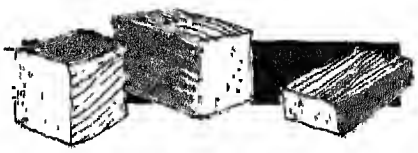


How did you group the objects? How did your friends group the objects?

Each material differs from the others in certain ways. But there are certain ways in which all materials are alike. You know that leather and plastic look different. They are used for different purposes. Yet both leather and plastic are alike in certain ways.

Similarly wood, water and air seem very different from each other. If you keep a piece of wood on a table it stays there. But if you pour water on the table it spreads out or flows. You can see wood and water. You cannot see air. But you can feel air moving around you, especially when it is windy. Yet wood, water and air are alike in a certain way.

In what way are wood, water, and air alike? How are all materials alike?



DO THIS ACTIVITY

Take a box made of hardboard or tin. Take a few wooden blocks. Put the blocks one by one in the box. Keep putting in the blocks till the box is full. When the box is full, can you put any more blocks into it? Why not?

Each wooden block occupies a certain amount of space in the box. The box has certain amount of space in it. It can hold only a certain number of blocks. When the box is full with wooden blocks, they occupy the entire space in the box. So it cannot hold any more wooden blocks.

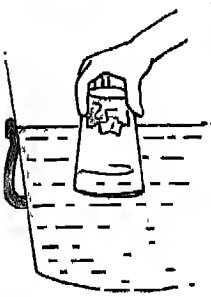
Wood occupies space. Does water occupy space?

You know that if a glass tumbler is full of water, it cannot hold any more water. The tumbler can hold only a certain amount of water. Once the glass is full, no more water can be added. The water already present in the tumbler occupies the entire space in it. No space is left to hold any more water. So if you add more water, it would move out of the tumbler.

Water occupies space in its container. Wood and water are alike in one way. They occupy space.

Does air also occupy space?

DO THIS ACTIVITY



Take a long glass tumbler. Crumple a piece of paper. Put it inside the tumbler. Press the paper to the bottom of the tumbler. Slowly turn the glass tumbler upside down. Now slowly push the tumbler into water. Push it to the bottom of the bowl. Does water enter into the tumbler? Does it completely fill the tumbler? Lift the tumbler from the water. Feel the paper inside the tumbler. Why does it remain dry?

You know there is air around us. The tumbler also contains air. It occupies some space. So the water does not completely fill the tumbler. Air occupies the space around the paper. Water cannot enter into this space. So the piece of paper remains dry. This suggests that even though we cannot see air, it occupies space.

Now you know one way in which wood, water and air are alike. All of them occupy space. This is true of all materials. Materials like tin, leather, iron, plastic, rubber, kerosene oil, coconut oil and air are alike in one way. They all occupy space.

Scientists use a special term for all materials. They call all materials matter. All materials occupy space. Thus, matter occupies space. Anything that occupies space is matter.

TEST YOURSELF

1 Name three objects each made of plastic, iron, leather, glass and wood. Name at least ten materials that we use every day.

2 Name five objects each made of more than one material.

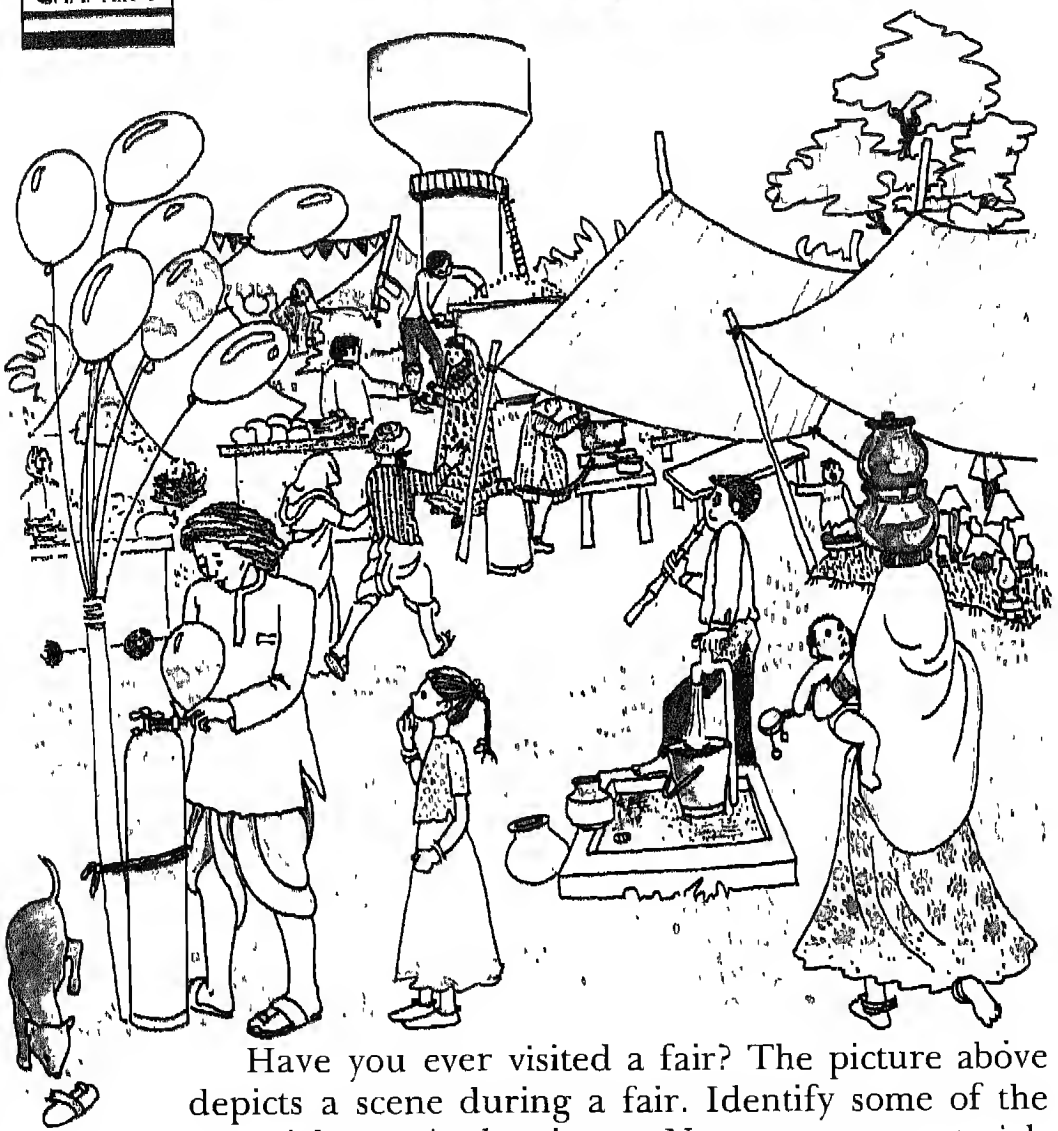
3 How are plastic and paper different from each other? List as many differences as you can.
4 In what way are all materials alike?
5 What do you mean by the term 'matter'?
6 Take a glass tumbler. Fill it completely with water. Put a piece of stone inside the tumbler. Why does the water come out of the tumbler?

THINGS TO DO

1 Take a glass tumbler. Pour some water into it. Note the level of water. Take a piece of stone. Slowly put it inside the tumbler. Why does the level of water rise? Now remove the stone from the tumbler. What happens to the level of water in the tumbler? Why does this happen?
2 Take a glass tumbler. Take a bowl containing water. Turn the glass tumbler upside down. Push it into the water. Does water fill the tumbler? Tilt the glass tumbler. What do you notice? Does water fill the tumbler? Why does this happen?
3 Take a marble, a cork, a piece of wood and a stone. Put them in a vessel containing water. Which of them sink in water? Which of them float on water? Name two more materials which do not sink in water.
4 Collect pieces of glass, stone, brick, wood and coal. Take a nail, marble and a rubber cork. Take a hammer or any other heavy object. Strike it on each material. Which materials break easily? Which of them do not break easily? Name two more materials which do not break easily.
5 Take a spoon and a plate made of stainless steel. Collect pieces of tin, leather, paper, hardboard and wood. Observe the surface of each material. Which of them are shiny?

CHAPTER 9

Solids, Liquids and Gases



Have you ever visited a fair? The picture above depicts a scene during a fair. Identify some of the materials seen in the picture. Name as many materials as you can. Prepare a list of these materials.

You know of one way in which materials like wood, water and air are alike. They all occupy space But each one is also different from the others in some ways. In what ways are they different from one another?

DO THIS ACTIVITY

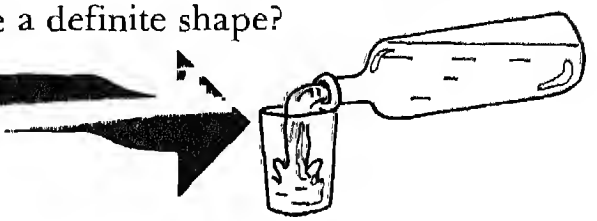
Keep a wooden block and a piece of stone on a table. Observe their shapes carefully. Keep them at different places. Do you notice any change in their shapes?

A piece of wood or stone has a definite shape of its own. It retains its shape wherever it is placed.

A material like wood is called a solid. A solid has a definite shape. Materials like iron, plastic, tin, rubber and leather also have definite shapes. They are solids.

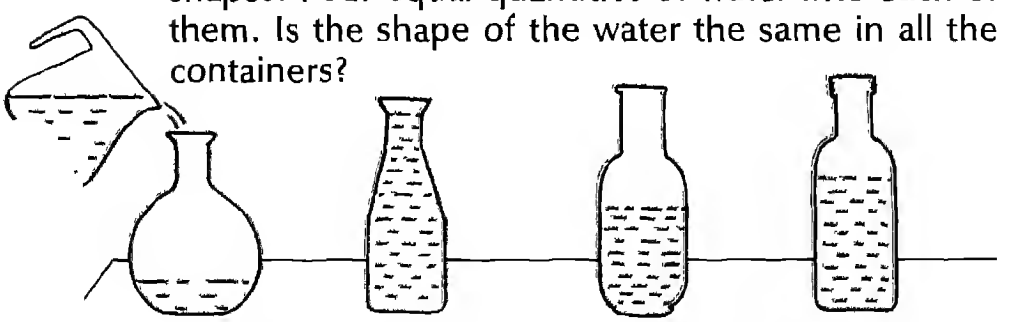
Does water have a definite shape?

DO THIS ACTIVITY



Take some water in a bottle. Observe the shape of the water. Pour water from the bottle into a glass tumbler. Does the shape of the water remain the same?

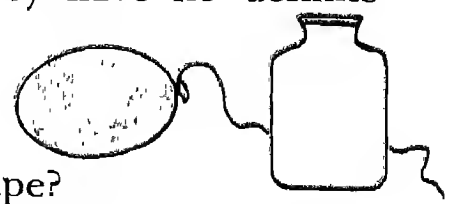
Take three or four bottles of different sizes and shapes. Pour equal quantities of water into each of them. Is the shape of the water the same in all the containers?



If you pour water into a container like a bottle, it takes the shape of the part that it fills. Water has no shape of its own. It changes its shape readily. It does not have any definite shape.

A material like water is called a liquid. A liquid has no shape of its own. It takes the shape of its container.

Milk, kerosene oil and coconut oil also take the shape of their containers. They have no definite shape. They are liquids.



Does air have a definite shape?

Like a liquid, air also has no shape of its own. It also takes the shape of its container. The air in a bottle takes the shape of the bottle. The air in a room takes the shape of the room. If you fill air into a cycle tube, it takes the shape of the cycle tube.

A material like air is called gas. A gas has no shape of its own. All gases take the shapes of their containers. They change their shape readily.

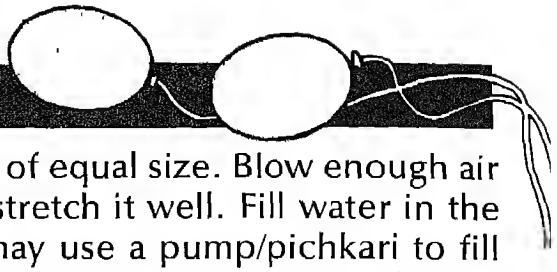
Can you name two gases? In fact, air is a mixture of gases. It consists of oxygen, nitrogen, carbon dioxide and several others. We cannot survive without oxygen. You cannot see the gases in the air. You cannot smell them.

Are you familiar with a gas used for cooking? You cannot see it. But you can smell it.

Scientists refer to solids, liquids and gases as the three states of matter. The term 'state' means a form that matter can have. Each state of matter is different from the others. Solids have definite shape. Liquids and gases have no definite shape. If you keep a solid on the table, it stays there. But if you pour a liquid on the table it flows and spreads out.

Liquids and gases are alike in one way. The
no shape of their own. However, gases are d
from liquids in certain ways. In what ways a
different?

DO THIS ACTIVITY



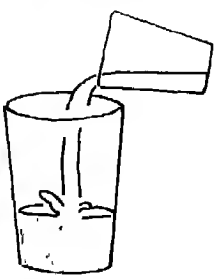
Take two balloons of equal size. Blow enough air into one of them to stretch it well. Fill water in the other balloon. You may use a pump/pichkari to fill water in the balloon. Fill sufficient quantity of water in the balloon. The size of this balloon should be almost the same as that of the balloon filled with air. Keep both balloons on the floor. Loosen their necks simultaneously. Which balloon becomes flat faster? Why?

The balloon filled with air becomes flat faster. The air in it rushes out immediately. The water in the second balloon moves out slightly slower than the air in the other balloon. Air flows more easily than a liquid. All gases flow more easily than liquids.

Suppose you have some cooking gas in a cylinder. If you open the cylinder, you will soon smell the gas all over the room. This suggests that a gas fills any amount of space that it can get into. A gas occupies the entire space in its container

Does a liquid take up the whole space in a container?

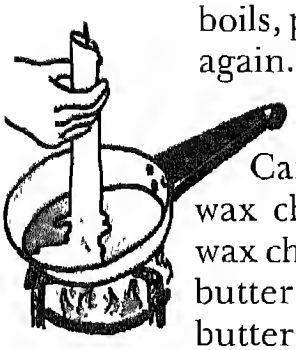
DO THIS ACTIVITY



Take a small glass tumbler. Take another glass tumbler of bigger size. Fill the small glass tumbler with a liquid like water. Pour it into the bigger tumbler. Does the liquid completely fill the bigger tumbler?

The liquid occupies the entire space in the smaller tumbler. It occupies only a certain amount of space available in the bigger tumbler. It does not occupy the entire space in it. The space a liquid occupies in a vessel depends upon the quantity of liquid poured into it. A given quantity of liquid always takes up the same amount of space.

Matter can exist in different states. You are familiar with water. It can exist as a solid, liquid or gas. In the solid form it is ice. In the gaseous form it is water vapour or steam. If you heat ice, it melts to form water. If you continue to heat water for some time, it boils, producing steam. If you cool steam you get water again. If you cool the water sufficiently you will get ice.



Candle wax also changes its state. On heating, solid wax changes into liquid wax. On cooling, the liquid wax changes into solid wax. Similarly, on heating, solid butter changes into liquid butter. On cooling, liquid butter changes into solid butter.

In some of the states in India, in winter, coconut oil freezes and turns into a solid. If you heat the solid form of coconut oil, it turns into liquid oil.

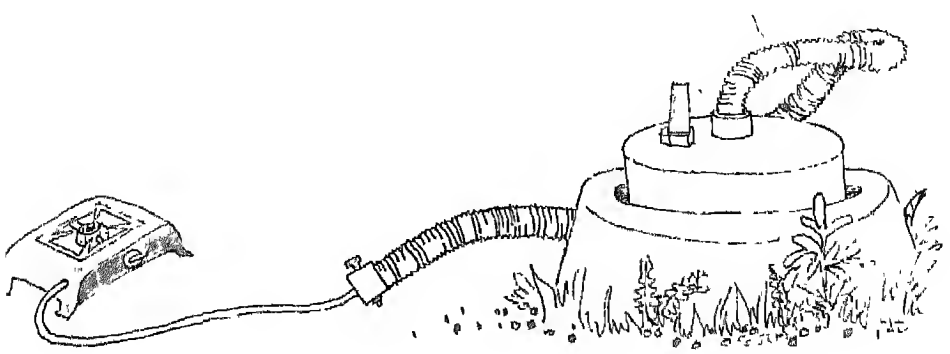
We use different solids, liquids and gases in our daily life. Most of the objects we use are made of solids. Solid materials are used for construction of buildings. They are used for making different kinds of objects like furniture and vessels. Liquids are used as drinks. We drink liquids like water and milk. Water is used for cooking food. It is also used for cleaning purposes and for washing clothes. A liquid like kerosene oil is used as fuel. Liquids like petrol and diesel are used in automobiles. Air is used in bicycle tyres, car tyres, football bladders, etc. Some gases like gobar gas and cooking gas are used as fuels.

TEST YOURSELF

1 In which state of matter does each of the following usually exist?
Candle wax, iron, glass, milk, honey, aluminium wire, petrol, soap, groundnut oil, common salt, coal, oxygen, paper, sponge, leather and rubber
2 State the differences between a solid and a liquid.
3 State the difference between a liquid and a gas.
4 Fill in the blanks :
(i) A solid has a definite_____
(ii) Liquids and gases take the_____of their containers.
(iii) When water boils it turns into_____
(iv) On cooling, steam changes into_____
(v) _____is the solid form of water.
5 Name two uses each of solids, liquids and gases.

THINGS TO DO

1 Take some water in a kettle. Heat it till the water boils. Place a metallic plate near the mouth of the kettle. Why do the droplets of water appear on the plate?
2 Is there a gobar gas plant in your locality? If so, visit it. Find out how gobar gas is prepared. Find out the uses of gobar gas.



CHAPTER 10

Water : A Wonderful Liquid

You are familiar with some of the uses of liquids. Of all the liquids, the one which is most important and useful, is water.

Think of the ways you use water in your daily life. You use it to bathe. You use it to wash your clothes. You use it for drinking. You cannot live for long without water. You use it to clean many objects used in your daily life. Water is used to cook your food. Plants cannot live without water. Animals cannot live without water. Without water, the earth would be a lifeless place.

There are many reasons why water is so important to us. One of them is that it dissolves a large number of solids.

How can you find out whether a solid dissolves in water or not?

DO THIS ACTIVITY

Put some sugar in a glass tumbler. Stir it with a spoon. What happens to the sugar? Put some sand in a glass tumbler. Stir it with a spoon. What do you observe?

When you stir the water with sugar, the sugar gradually disappears. Where does the sugar go? It dissolves in the water. You get a solution of sugar. A liquid that contains a dissolved material is a solution.

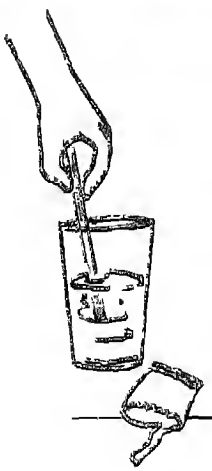
If you put sand in water, the sand does not disappear. Sand does not dissolve in water.

When a solid is dissolved in a liquid, the solid disappears. Ocean water, well water and ink contain dissolved solids. But you cannot see these dissolved solids.

Water dissolves several solids. Common salt, ink tablets and gur dissolve easily in water. Chalk powder, coal and wood do not dissolve in water.

How much common salt can be dissolved in a given quantity of water?

DO THIS ACTIVITY

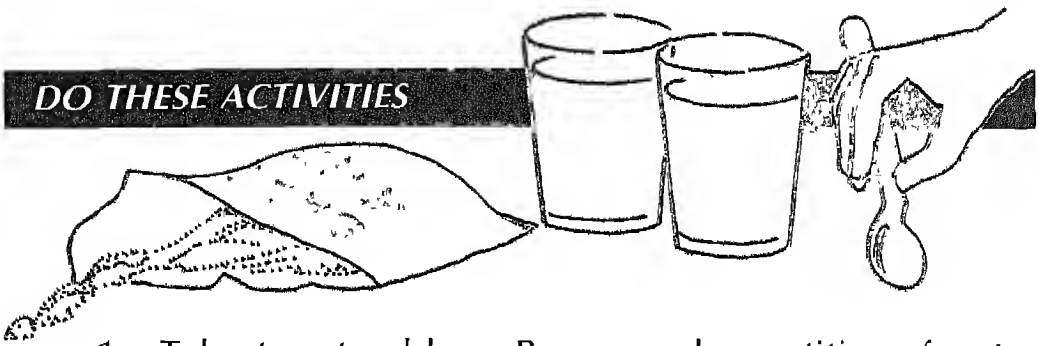


Fill half of a glass tumbler with water. Prepare small packets of common salt. Each packet should contain one teaspoonful of common salt. Add common salt from one of these packets to the water and stir it. Once this salt is completely dissolved in water, add salt from another packet. Stir the water again. Repeat, adding salt. Go on doing this until some salt remains undissolved. How many packets or teaspoonfuls of salt dissolved in the given quantity of water?

A given quantity of water can dissolve only a certain amount of common salt. Similarly, only a certain amount of sugar can be dissolved in a given quantity of water. Some solid materials dissolve quickly in water. Some take more time.

How can we dissolve materials quickly in water? What conditions help in dissolving solids in water?

DO THESE ACTIVITIES



1 Take two tumblers. Pour equal quantities of water in them. Take a lump of common salt and equal amount of powdered common salt. Put the lump of common salt in one tumbler and the powdered common salt in the other. Which dissolves more quickly? You should not stir the water.

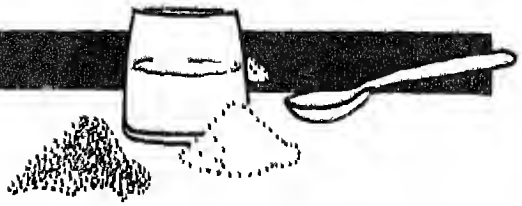
2 Take two glass tumblers filled with water. Ensure that they contain equal quantities of water. Add equal amounts of powdered common salt in each tumbler separately. Stir the water in one of the tumblers. Do not stir the water in the other tumbler. In which tumbler does the common salt dissolve first? What conclusion do you come to?

3 Take two glass tumblers. Pour some cold water into one of them. Take an equal quantity of hot water in the other tumbler. Add equal amounts of powdered common salt in each tumbler separately. In which tumbler does the common salt dissolve more quickly?

Stirring helps in dissolving a solid faster in water. Small particles of a solid dissolve faster than large ones. The hotter the water, the more quickly does a solid dissolve.

Often we are faced with the problem of separating one material from another. Suppose you have common salt and sand mixed together. How can you separate the sand from the common salt?

DO THIS ACTIVITY



Take some common salt and sand, which are mixed together. Put them in a glass tumbler containing water. What happens to the sand? What do you find at the bottom of the glass tumbler? Slowly pour the solution into another container. Separate the insoluble solid material.

TEST YOURSELF

1 Name three solids which dissolve in water.
2 Name five solids which do not dissolve in water.
3 What is a solution?
4 What are the best conditions which help in dissolving a solid quickly in water?
   (i) Large pieces of a solid or its powdered form
   (ii) Stirring or not stirring
   (iii) Hot or cold water
5 Suppose you have common salt and chalk powder mixed together. How will you separate the chalk powder from the common salt?

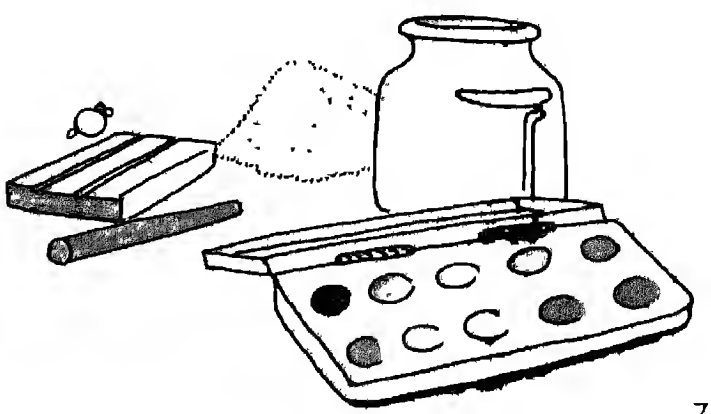
THINGS TO DO

1 Collect a few solid materials available in the house or in the surroundings. Group the materials which dissolve in water.
2 Dissolve common salt in water in a beaker. Go on dissolving common salt until some of it remains undissolved. Heat the water. Dissolve more common salt. Now cool the hot solution. What do you observe at the bottom of the beaker? Write your observations.

3 Common salt is obtained from sea water. How is it produced? Find out.

4 Take equal quantities of water in two glass tumblers. Dissolve common salt in one of them. Find out how many teaspoonfuls of common salt can be dissolved in the water. Dissolve sugar in water in the other glass tumbler. Find out how many teaspoonfuls of sugar can be dissolved. Compare the amount of common salt and sugar dissolved. What conclusions do you arrive at?

5 Take some kerosene in a vessel. Put some coal-tar into it. Does coal-tar dissolve in kerosene? Does it dissolve in water?



CHAPTER 11

Weather

Sometimes you notice that it rains in the morning. It becomes dry in the afternoon. Sometimes it is sunny in the morning. But it becomes cloudy in the evening. Sometimes it is very windy. After sometime, all is calm. All this makes up the weather.

What type of weather are you having right now? Is it raining? Is it cloudy or sunny? Is it calm or windy?

What type of weather did you have yesterday?

DO THIS ACTIVITY

Recall the type of weather you had yesterday. Prepare a table like the one given below on your slate or notebook. Write down your observations.

Time	*Type of weather*			
	Rainy or dry	*Windy or calm*	*Cloudy or sunny*	*Warm or cold*
Morning				
Noon				
Evening				
Night				

What causes the different types of weather? Where does the water that falls as rain, come from?

You have seen that wet clothes dry when they are hung out in the air. If you pour some water on a table or on the floor, it disappears slowly. Where does the water go when things dry? What happens to the water?

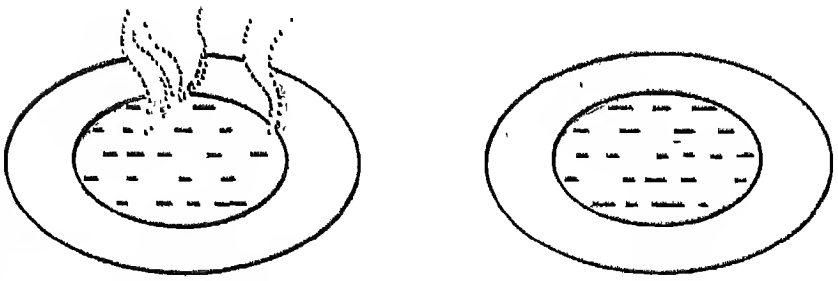
Water seems to disappear by a process called evaporation. Evaporation is a process by which a liquid changes into vapour. When water evaporates, it changes from a liquid into water vapour. Water vapour is the gaseous form of water. Wet things dry when the water in them becomes water vapour and moves into the atmosphere.

You cannot see water evaporating into water vapour. Water vapour exists in the form of very tiny particles. They are so small that they cannot be seen.

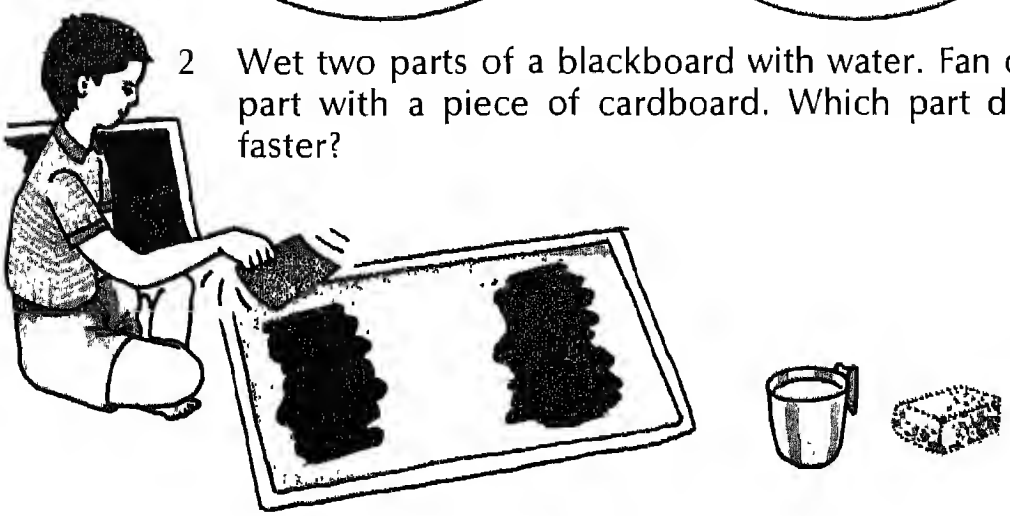
Sometimes water evaporates faster than at other times. What conditions help water to evaporate faster?

DO THESE ACTIVITIES

1 Take equal amounts of water in two metallic plates of the same shape and size. Heat one of the plates. From which plate does the water evaporate faster?



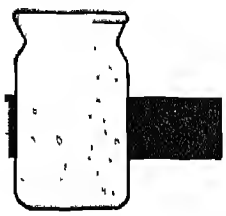
2 Wet two parts of a blackboard with water. Fan one part with a piece of cardboard. Which part dries faster?



You can speed up the evaporation of water by heating it. Hot water evaporates faster than cold water. The wind also helps in evaporating water faster. You must have seen that wet clothes dry faster on a windy day.

Water evaporates from ponds, lakes, rivers and oceans. When the water is heated by the sun, it changes into water vapour. It is this water vapour that becomes cloud and rain.

How is rain formed?



DO THIS ACTIVITY

Put some ice and water in a clean, dry glass jar. Keep the jar in a place for some time. What do you notice on the outer surface of the jar? Touch and feel the jar. Now wait a little longer. Observe the outer surface of the jar. What do you notice?

To begin with, a misty layer of water appears on the outer surface of the glass jar. A little later, small droplets of water appear. Where do they come from? How are they formed?

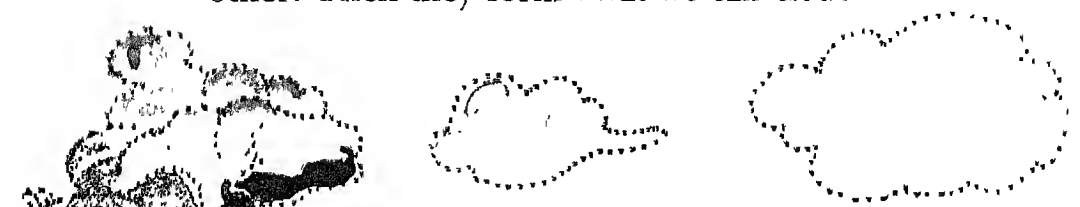
You know that when steam is cooled, it changes into water. Similarly, on cooling, water vapour changes into water. The outer surface of the glass jar is exposed to the air around it. The air around the jar contains water vapour. This water vapour comes into contact with the cold glass jar. Then, it cools and changes into water, by a process called condensation.

Condensation is a process by which vapour changes into liquid. It is the reverse process of evaporation. For instance, water changes into water vapour during evaporation. During condensation, this water vapour changes back into water.

Sometimes you might have noticed droplets of water on the grass in the morning. How did water collect on the grass? Where does it come from?

At night, the grass becomes cool. The water vapour above the surface of the earth comes into contact with the grass. Then it condenses on the grass to form water droplets.

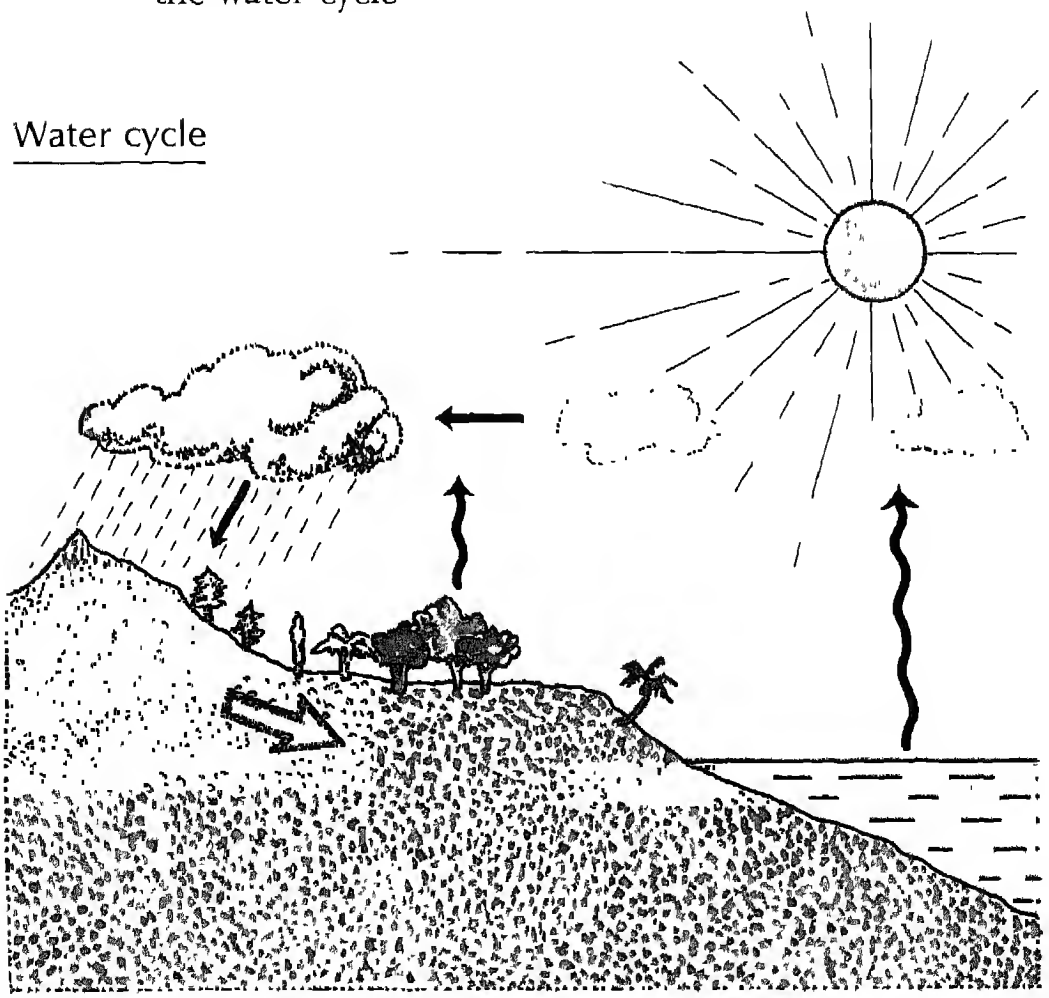
Water constantly evaporates from ponds, lakes, rivers and oceans. The water vapour moves upwards. It comes into contact with tiny particles of materials such as dust or smoke floating in the air. Water vapour cools when it comes into contact with these particles. It condenses on the dust or smoke particles and forms small water droplets. These water droplets float in the air. Gradually these water droplets come closer to each other. Then they form what we call cloud.



As the clouds become cooler, more water condenses on the water droplets already formed. The water droplets become larger in size. They become too big to float in the air. Then they fall to the ground as rain.

Water from the earth's surface goes into the air as water vapour This water vapour leads to the formation of clouds. From the clouds, the water again comes back to the earth as rain In other words, water goes through many changes and finally ends up in the same form. During this process, water goes through a cycle of events. This cycle of events is called the water cycle

Water cycle



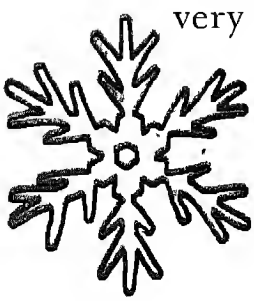
The water cycle affects the weather. When the sky is full of clouds, the sun gets hidden by the clouds. Then the weather is said to be cloudy.

Water vapour sometimes forms cloud near the ground. Such cloud is called fog. Fog is formed when water vapour near the surface of the earth condenses on small particles of materials. The water vapour forms extremely small visible droplets. These droplets float in the air near the surface of the earth. They form the fog. When the weather is foggy, everything on the ground seems to be covered by cloud. Things look wet You can feel the wetness when it is foggy

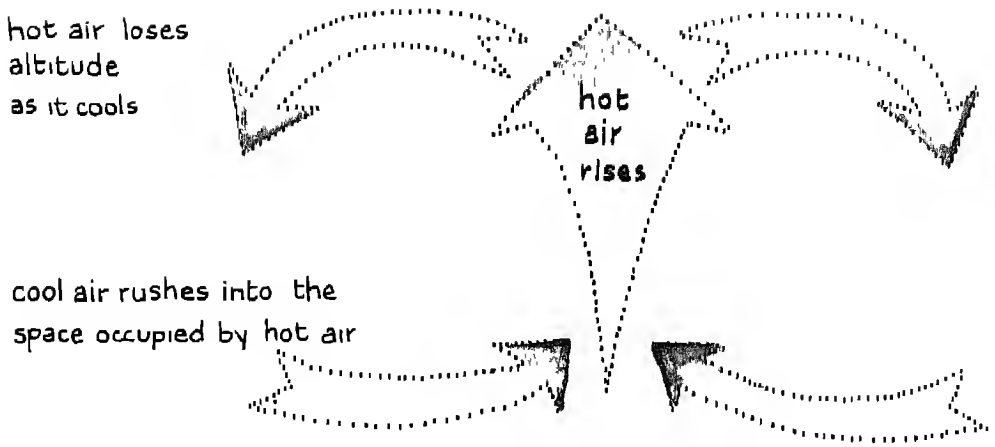
Sometimes the sky remains cloudy for a few days. Sometimes you see white clouds floating in the sky. They may not lead to rain. But when the clouds are grey or black, it usually rains. When it rains you experience cool weather.

In some states of India such as Himachal Pradesh and Jammu and Kashmir, snowfall takes place in the months of December and January. How is snow formed?

When clouds become very cold, the water vapour freezes and turns into snow. The snow comes down to the earth. The snowfall makes the weather very cold.



a single snowflake (enlarged)



When there are no clouds in the sky we experience sunny weather. Bright sunshine always makes the air around the earth warm. Warm air moves upward. The cool air moves towards the space occupied by warm air. It pushes the warmer air sideways and upward. As a result the air moves along the earth's surface. We call the moving air, wind.

The weather affects us in many ways. If the weather is very warm or very cold we feel uncomfortable. During hot weather, working outside in the sun becomes more tiring. Open air games are not comfortable if the weather is very hot. Outdoor activities are also difficult during rainy weather. Foggy weather affects the movement of vehicles on the roads. It also affects the movement of aircraft. Aircraft do not take off or land during foggy weather.

We prefer sunny days for travel or sports. Crops get spoilt if unexpected rain occurs during the harvesting time.

How often have you thought, "will tomorrow be dry or rainy, cloudy or sunny"? Did you ever plan a journey and have to cancel it due to sudden rain? On how many occasions were you got caught in the rain without an umbrella?

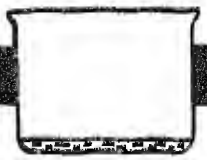
Sometimes the weather changes suddenly. A clear sky suddenly becomes cloudy. Winds can appear in a very short time. A dry day can suddenly change into a rainy day.

Many of our activities are affected by changes in weather. Therefore, people have always tried to predict or forecast the weather. It helps us if we can know what the weather will be like the next day or on a future date. Information about the weather on a future date is called weather forecasting. Newspapers, radio and television carry weather reports. Weather forecasts are important to farmers, aeroplane pilots and navigators of ships in the sea. Farming activity depends upon the weather during a particular period in a year. Weather forecast is also important for fishermen who go out to the sea for fishing.

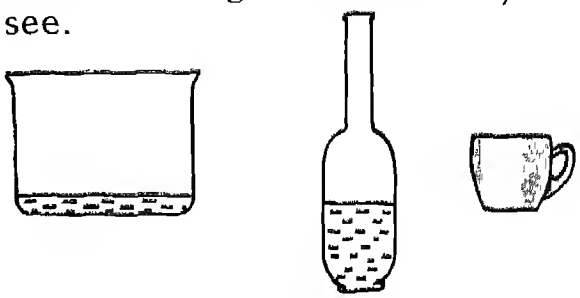
TEST YOURSELF

1 Fill in the blanks :
   (i) The gaseous form of water is called _____
   (ii) The process by which a liquid changes into vapour is known as _____
   (iii) The process by which vapour changes into liquid is called _____
2 List the conditions which favour evaporation.
3 How does the water vapour in the atmosphere get condensed?
4 How does water vapour come down as rain?
5 List the steps involved in the water cycle.
6 How is fog formed?
7 What causes wind?
8 What is meant by weather forecasting?

THINGS TO DO



1 Take a wide vessel. Pour a little water into it. Keep the vessel in the sun for a few hours. What happens to the water? Would the same thing happen if you had kept the vessel containing water inside your house? Try it and see.



2 Pour one cup of water into a wide vessel. Pour another cup of water into a tall and narrow vessel/jar. Place both in the sun. From which vessel does the water disappear more rapidly? Why does it so happen?

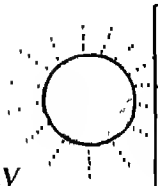
3 Take some ice pieces in a glass tumbler. Add some cold water and stir the water. What do you notice on the outer surface of the glass tumbler? Why does it happen? Take some hot water in another glass tumbler. Stir the hot water for a minute. What happens this time?

4 Prepare a chart showing the water cycle.

5 Observe the clouds in the sky. Observe their colours and their movement across the sky. Choose a cloud and draw a sketch of it.

6 Listen to weather reports on the radio. Cut out some weather reports that appear in the newspaper.

7 Keep a weather chart. Show weather conditions, as indicated in the chart below.



Day	*Weather Record*			
	Rainy or dry	*Windy or calm*	*Sunny or cloudy*	*Warm or cool*
Sunday	Rainy	Windy	Cloudy	Cool
Monday	Dry	Calm	Sunny	Warm
Tuesday	Dry	Slightly windy	Partly cloudy	Warm
Wednesday				
Thursday				
Friday				
Saturday				

8 Forecast the weather for a week. Note down your forecast. Observe the weather on each day in a week. Compare it with the forecast you made.Do you find any similarity?

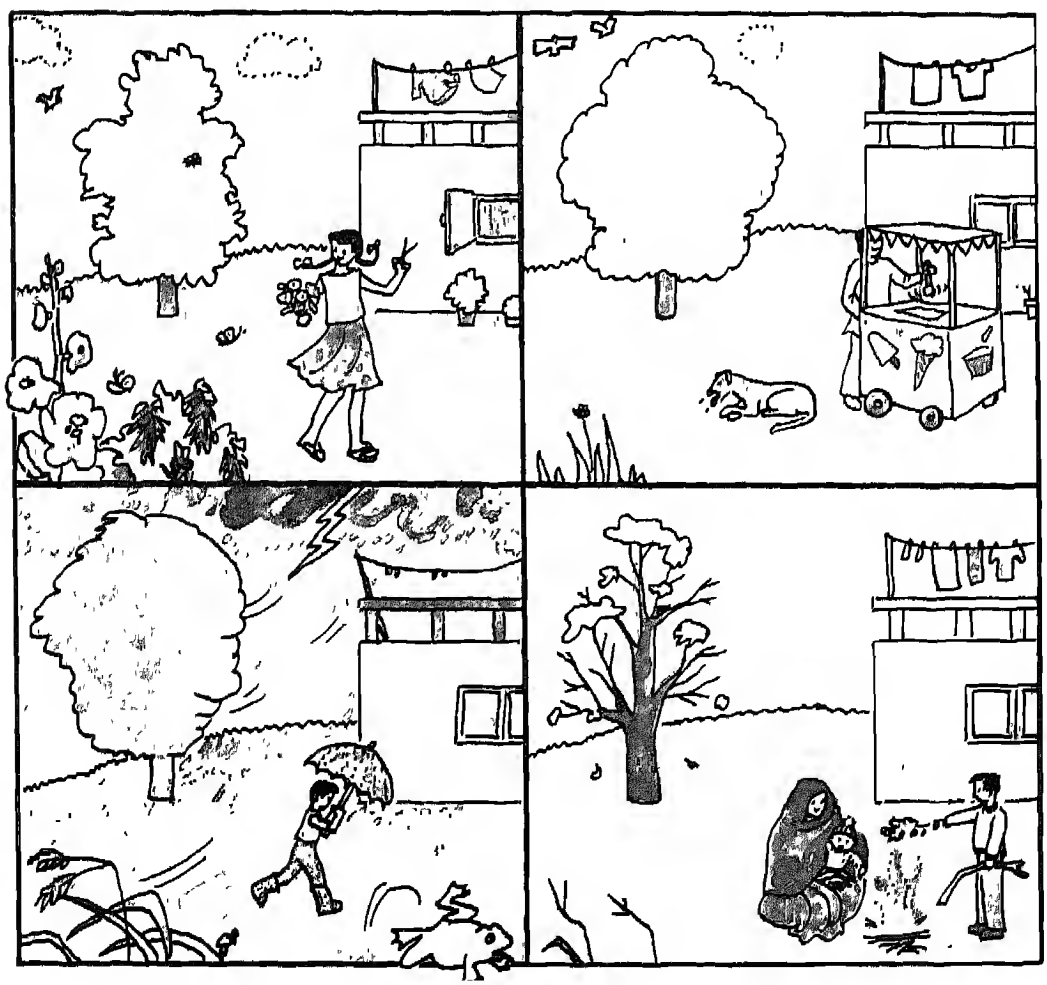
9 Collect the weather forecast for a week from newspapers. Identify the changes in weather during the week.

CHAPTER 12

The Seasons

You are now familiar with different types of weather. At a particular time on a day the weather may be clear or cloudy, dry or rainy, calm or windy. Weather may change quickly from one kind to another.

Sometimes it rains on most of the days in a month. Sometimes it remains cloudy on four or five days. Have you observed such situations?



DO THIS ACTIVITY

Recall the different types of weather you have experienced during the past one month. Discuss this with your friends. Find out the number of days on which a particular weather condition occurred. Record your findings in a chart as indicated below.

Weather conditions	*Number of days*
Rainy	
Sunny or clear	
Cloudy	
Partly cloudy	
Warm	
Cool	
Windy	
Calm	

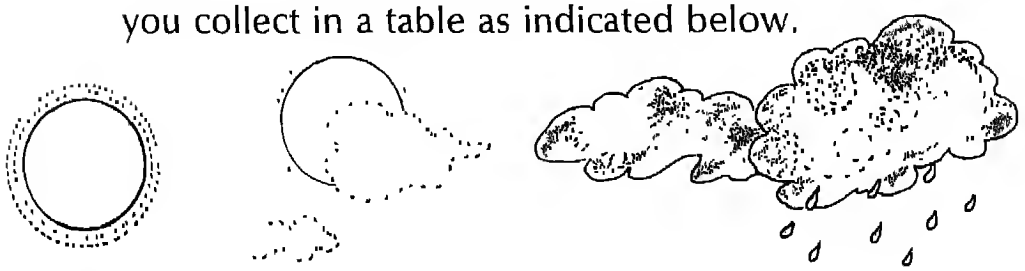
What do you notice? Were most of the days rainy? Was it dry on most of the days? Did the weather continue to be sunny and clear on all the days? Were most of the days cloudy but without rain? Were the days warm throughout the month? Have all the days been cold?

You may observe that a particular kind of weather continued for a few days. For instance, you may find that in a month it rained for 20 days or it remained sunny and warm on all days. You may perhaps observe that the entire month has been very cold. You may notice that most of the days in the month had the same type of weather.

Do similar weather conditions remain for a period of two or three months?

DO THIS ACTIVITY

Discuss the changing weather conditions with your family members. Find out which months have similar weather conditions. Record the information you collect in a table as indicated below.



Weather condition	*Months*
Warm weather	
Cold weather	
Rainy on most of the days in the month	

Which are the months during which there is rain on most of the days? Which months are very warm? Which months have cold weather? Which month is the warmest? Which month is the coldest? Which month has the most rain? Which month has the least rain?

There is a period during which the weather continuously remains rainy for a few days or weeks. This period is called the rainy or monsoon season. Just before the monsoon season, we experience days which are very warm. This period is called the summer season. After the rainy or monsoon season, the days become cooler and cooler. This period lasts for about two to three months. This period is called the winter season.

The sky remains bright and sunny during summer. Later on, the sky becomes cloudy. Gradually the sky becomes covered by dark, thick clouds. These clouds lead to rain. The monsoon season begins at this stage. During the monsoon season we get rain on most of the days. Then the cloudy sky gradually clears up. This is followed by days which are cold. The summer comes after the winter season.

In some places in India, the summer days are very warm. The winter days are very cold in some places. Do you live in such a place? For instance, in Delhi, the summer days are very warm. The winter days are very cold.

Some places in our country experience only a mild winter. Madras is one such place. In Madras it is very hot in summer. The summer is followed by the rainy season. Then comes a period of mild winter. But even in Madras, the winter days are cooler than the other days. The hottest days come in the summer season.

Is the weather condition during a season at one place the same as that in other places?

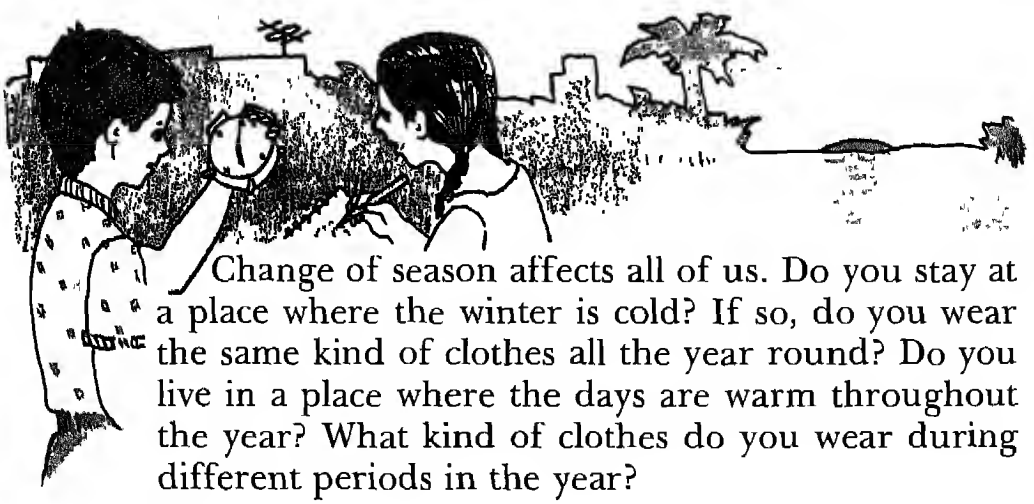
You may experience a particular kind of weather during a season. This may be quite different from the kind of weather during the same season in another place. For instance, the summer days in Delhi are much warmer than the summer days in Srinagar. The winter days in Srinagar are colder than the winter days in Delhi.

Have you noticed any changes in the time the sun rises and sets? During which season does the sun rise earlier and set later? During which season does the sun rise later and set earlier? During which period are the days longer and nights shorter? Which season has shorter days and longer nights?

The sun rises earlier in summer than it does in winter. The sun sets later in summer than it does in winter. The summer days are longer than the winter days in most places in India. The winter days are shorter than the summer days.

DO THIS ACTIVITY

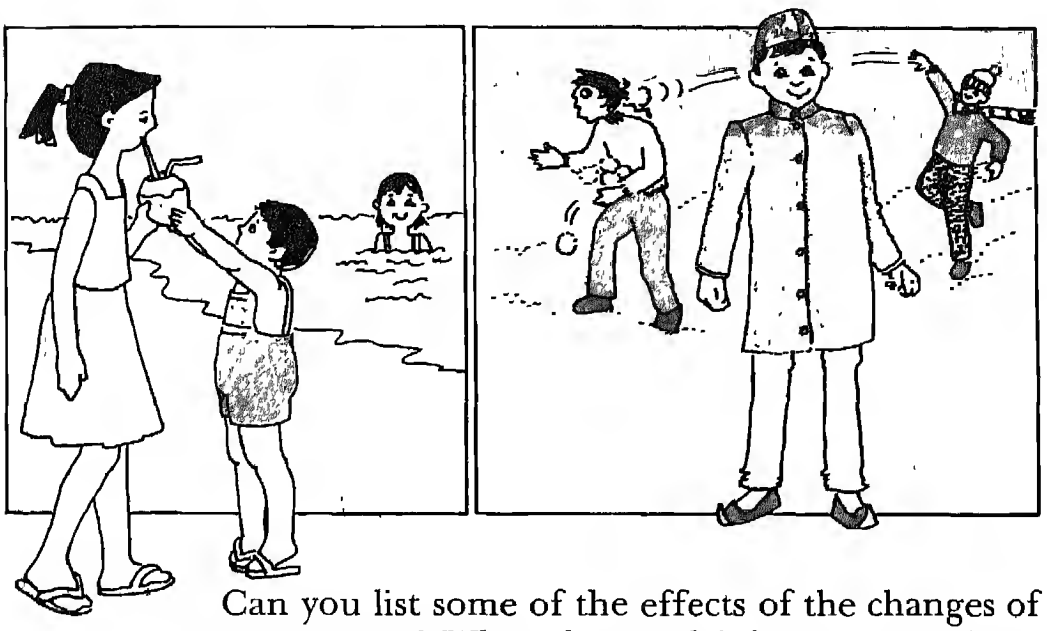
Find out the time the sun rises and sets. Compare the length of the day and night. Which is longer?



Change of season affects all of us. Do you stay at a place where the winter is cold? If so, do you wear the same kind of clothes all the year round? Do you live in a place where the days are warm throughout the year? What kind of clothes do you wear during different periods in the year?

Recall the kind of clothes you wear in summer and in winter. Why do people use warm, woollen clothes in winter? What kind of clothes do people use in summer?

In winter, warm clothes protect us from the cold weather. In summer, cotton clothes are comfortable.



Can you list some of the effects of the changes of seasons on you? When do you drink more water? Do you drink more water in summer or in winter? During which period do you sweat more?

There are places like Delhi, Shimla and Srinagar where the winter days are very cold. In such places people use things like heaters and blankets to keep themselves warm. In summer, people use things like fans and coolers to keep themselves cool.

Changes of seasons affect plants also. Different crops grow in different seasons. Different vegetables and fruits become available in different seasons. Find out which vegetables are available in different periods in a year. During which period do some of the trees in your locality flower?

DO THIS ACTIVITY

Observe the trees in your surroundings. Name them. Find out during which month each of them flowers. Discuss with your teachers or the elders in your community. Record your observations in a table as indicated below.

Name of trees/plants	*Months during which they flower*

During the summer and rainy seasons, plants grow well. Since the summer season is the dry season of the year, plants must get sufficient water in order to grow well. Plants grow rapidly during the rainy season.

Animals become inactive during very cold winter days. Have you observed lizards and snakes during winter? Have you ever observed frogs and turtles in winter? You would have observed that they remain quiet and inactive during the cold, winter season. They become active again in summer.

Winter is not very cold in Madras or Bombay. Lizards, frogs and turtles which live in such warm places, remain active throughout the year.

TEST YOURSELF

1 Fill in the blanks :

(i) The period during which the weather remains rainy is called————season.

(ii) The period during which the weather remains cold is called————season.

(iii) The period during which the weather remains very warm is called————season.

(iv) The sun rises early and sets late in———— season.

(v) The sun rises late and sets early in————season.

(vi) The days are longer than nights in————season.

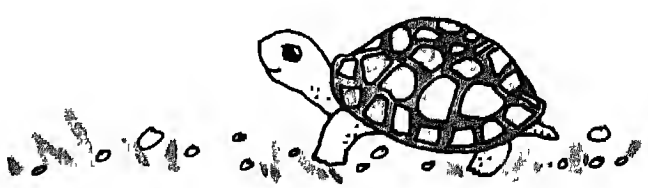
(vii) The nights are longer than days in————season.

THINGS TO DO

1 Note down the time of sunrise and sunset. Do this every day for a month. Does the duration of daylight become longer or shorter? What change in season is taking place?

2 Prepare a list of the animals in your surroundings. Observe these animals as the seasons change. Do all of them remain active throughout the year? Which of them remain active in winter. Do any of them become inactive in winter?

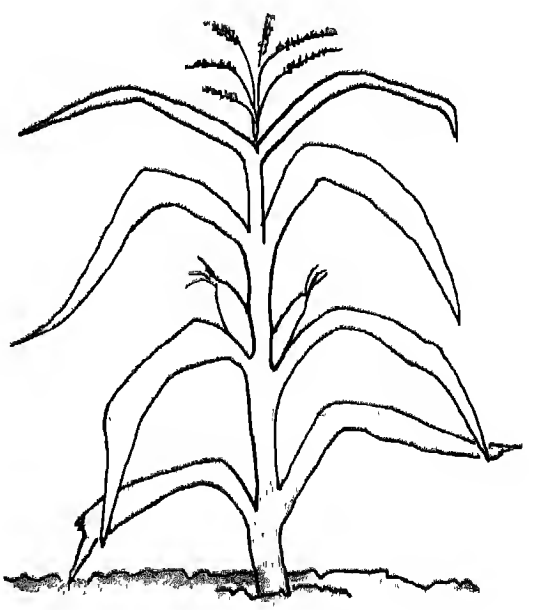
3 Are there turtles in your surroundings? If so, keep one in the school. Give the turtle adequate food and water every day. Observe the turtle on warmer days. Observe it on winter days. What does it do in winter?



4 Observe the plants in your locality. Note down the months during which they flower.

5 Observe the crops grown in your village/locality. During which months are they grown? Record your observations as indicated below.

Crops	*Months during which the crop is grown*



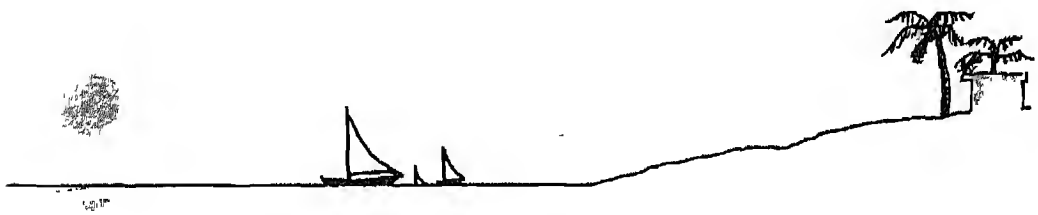
CHAPTER 13

The Sky

You know we all live on the earth. If you look up at the sky on a clear day you can see the sun. The sun provides light. It also heats the land and the water and other things on the earth's surface.

DO THIS ACTIVITY

Look at the sun in the early morning. Locate the direction from where it rises. Look for the sun in the evening. Locate the direction where it sets. Observe the sun and the sky around it when it rises or sets. How big does the sun seem to be? What is its shape?



The sun rises in the east. It sets in the west. The sun appears to be very small to us. But this is not so. It is much bigger than the earth.

Why does the sun appear to be small?

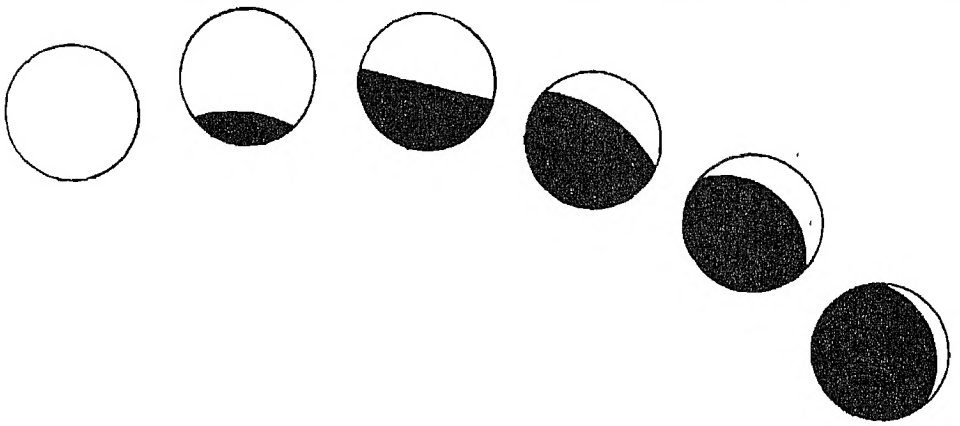
DO THIS ACTIVITY

Take a large water pot. Put it on the ground. Keep it in a large open space with its neck downwards. Paint it white, if possible. Now take another small water pot. Keep it about 200 metres away from the other pot. Stand near the smaller pot. Look at the bigger pot. What do you notice. Does it look smaller or bigger in size?

Objects look small when seen from a great distance. The sun is very far away from the earth. That is why the sun looks small. But the sun is many, many times bigger than the earth.

Besides the sun, what else do you see in the sky? We see the sun during the day. If you observe the sky at night, you can see the moon. Sometimes the moon is also seen during the day.

You know the earth gets light from the sun. Similarly, the moon also gets light from the sun.



You will have noticed that the visible portion of the moon seems to change from day to day. Soon after *Amavasya* you may see a very thin, new moon. You can see it in the sky at sunset. The new moon looks like a thin crescent. At this stage, if you look carefully, you will see a faint outline of the rest of the moon.

After the *Amavasya* the visible portion of the moon grows larger every night. The visible portion of the moon increases in size. After a few days half of the moon becomes visible. The visible portion continues to increase in size. At *Purnima* you can see a round, full moon. After *Purnima* the visible portion becomes smaller and smaller. At *Amavasya* the moon is not visible at all.

Besides the moon, what else do you see in the sky at night?

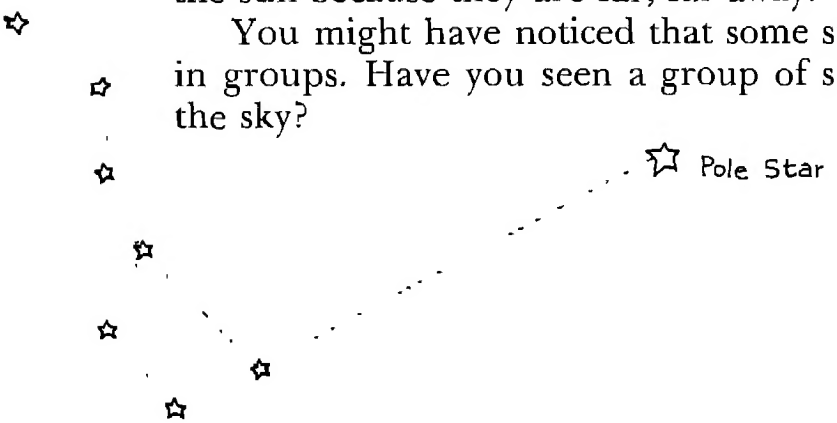
You can see a large number of stars in the sky at night. You see them all over the sky.

Are all the stars alike?

All the stars are not alike. Some of them are bigger than others. Some appear to be dim. Some appear to be brighter than the others. The stars seem to twinkle.

The stars are much bigger than the earth and the moon. Then why do they look so small? The stars are very, very far away from the earth. That is why they look small. The sun is a star nearest to the earth. Other stars are very far away Some stars are many times bigger than the sun. They appear to be smaller than the sun because they are far, far away.

You might have noticed that some stars are seen in groups. Have you seen a group of seven stars in the sky?



If you look in the north direction, you may see a bright star. This is the Pole Star. The position of this star helps in finding out the north direction.

TEST YOURSELF

1 Why does the sun look smaller than the earth?
2 Why do the stars look smaller than the sun and moon?
3 Where does the moon get its light from?
4 Fill in the blanks :
   (i) The sun rises in the_____and sets in the——
   (ii) At *Purnima* we see————moon.
   (iii) The————moon is seen immediately after *Amavasya*.
   (iv) The bright star seen in the sky in the north direction is called the————

THINGS TO DO

1 Observe the moon for a month. Start your observation from a day on which no moon is seen in the sky. Draw the visible portion of the moon in your notebook everyday. On which day was the moon round and bright? On which day was it half? On which day was the moon not visible at all? How many days did it take to come back to the same situation as on the day you started your observation?

2 Observe the sky at night. Identify the Pole Star and the group of seven stars. Take your parent's help. Draw the picture of the group of seven stars.

3 Locate the directions where the sun rises and sets. Locate the North and South direction. How will you do this?